

Linköping Studies in Science and Technology
Dissertations, No.1175

Entrepreneurship Policy
Public Support for Technology-Based Ventures

Charlotte Norrman
2008

Department of Management and Engineering
Linköping University, SE-581 83 Linköping, Sweden

© Charlotte Norrman, 2008
(unless otherwise noted)

“Entrepreneurship policy: Public Support for Technology-Based Ventures”

Linköping Studies in Science and Technology, Dissertation No. 1175
International Graduate School of Management and Engineering, IMIE
Dissertation No. 114

ISBN: 978-91-7393-923-2
ISSN: 0345-7524
ISSN: 1402-0793

Printed by: LiU-Tryck, Linköping
Cover photo: Nordens Ark

Distributed by:
Linköping University
Department of Management and Engineering
SE-581 83 Linköping, Sweden
Tel: +46 13 281000

*To my children,
Hanna, Edvin and Ellen*

Acknowledgements

This book is about support, and support has been a prerequisite for its completion. Long is therefore the list of those to whom I owe thanks and gratitude. First, I would like to thank my supervisor, Magnus Klofsten. With his positive attitude to my work (with the exception of my affection for cloud illustrations), he has coached me through this process. Furthermore, Magnus has always, and without any delay, dedicated time for discussion and supervision. Generating new ideas has never been my problem, but I sometimes face difficulties in choosing which ones to go for. Furthermore, no one will ever say that I am naturally structured. My second supervisor Anna Bergek (the queen of the red pen), on the other hand, has the abilities of which I lack. Thanks to Anna, there are now structure and coherence where there otherwise would have been a mess. Thanks also to Dylan Jones-Evans, for his excellent work as opponent during my final seminar.

This project could not have been realised without financiers. I therefore want to thank all of you that have put faith in my work and supplied money. First of all, I want to thank Ann-Louise Persson at Vinnova. She has been (and hopefully will continue to be), an engaged and demanding “customer”. Besides money, Ann-Louise has contributed with her great knowledge of the area studied. Thanks also to Kent Herrmansson at Vinnova. The former CEO at SIC, Per Laurell as well as Nutek deserves thanks for financing the initial studies of SIC.

Within the prologue to the method chapter, I have written about the importance of a network. I am a lucky person, as I have a large network of skilled people that have shared their wisdom and knowledge with me. I cannot mention all, but I have to mention some. Lars Bager-Sjögren, thanks for our endless and interesting discussions and for sharing your great knowledge in quantitative analysis, policy and Cuban dance in general. Staffan Öberg, thanks for patiently answering all my questions, and for all our discussions on business processes and coaching. My former colleagues at Teknikbyn, Evert Jonsson, the master of epithets (he inspired the naming of the selection approaches of incubators in paper 1), and Sven-Arne Paulson, together with you, I have had many unforgettable moments. Thanks also to our former employer Teknikbyn, for putting us together and for inspiring me to make these studies. Birgitta Clasing-Dahlberg deserves a special thanks for sharing her wisdom of life and work and not least, for lending me her cottage in Sälen. I also want to thank Roger Yttergren and Åke Wallin who have shared knowledge and information that was important for this work. Besides those that are mentioned by name, there are others that have also contributed. Not least, those engaged in the associations of inventors, and those who have responded to my interviews and questionnaires.

All my colleagues at IEI deserve thanks as well. As most of you know by now, I face severe problems keeping quiet and staying in my room, especially when I

meet with new interesting ideas or problems which I need to solve (normally without any hesitation). Dan Andersson, Christian Berggren, Ann-Christine Forsberg, Øystein Fredriksen, Nicolette Lakemond, Thomas Magnusson, Johanna Nählinder, Daniel Olausson, Rune Olsson, Carina Schärberg, and Rebecca Stenberg, all of you deserve a thank you for putting up with my impolite interruptions. Dag Swartling (additional to the above mentioned) has entertained me with irresistible bus wrecks, retailed cars (incl. free of charge service), and served as my hobby psychologist. Thanks also to Christina Öberg for interesting discussions and for sharing the burden of being a PhD in the last phase. Pamela Vang has worked hard to help me transform Lotta's English into the Queen's English. Mats Abrahamsson, was reader at IEI and gave useful comments at the end. Elisabeth Sundin fixed the initial money from Nutek 2003, which in fact was my ticket for this journey.

The final category of thankful thoughts is directed towards the private sphere. First, I must thank my husband Stephan, for loving me and for always being there and taking care of me and the family. Stephan has carried a heavy burden, especially during this winter and spring. Hanna, Edvin and Ellen, are my capable and dearly loved children. Thanks for putting up with an absent mother. A dedication in an uninteresting and boring book, written in a foreign language and with almost no pictures is probably not the way to show my affection and appreciation. However, I will do it anyway. Thanks also to my parents, Uno and Anita, my parents in law, Siw and Rolf, my brother Patrik, and my oldest friend Anna. All of you have contributed in different ways, not least by being who you are. Finally, I want to dedicate a special thanks to my grandmother Ellen, who is always very impressed and filled with admiration of her grandchildren and grand-grand children and all their fantastic adventures.

/Charlotte

Linköping, April 2008

Abstract

The subject of this thesis is entrepreneurship policy and the focus is on public support programmes directed to early stages technology-based ventures. It advocates that a broad view should be taken with regard to the type of policies for entrepreneurship that aim at supporting the facilitation of the supported ventures' ability to link to their surrounding innovation system, in which they can secure their access to crucial external resources. Taking the departure in the perspective that early stages technology-based ventures are vulnerable, this thesis shows that publicly financed entrepreneurship supporting programmes can be motivated because small and newly started ventures have got limited resources, and because the risks, with which they are associated, generally make them unattractive in the eyes of private actors.

Among the practical implications of this thesis, the following findings are emphasised: Public support, directed to the very earliest stages of venture development benefits from broadness, for the latter stages, specialisation and a higher degree of selectiveness could be an advantage. Moreover, it is important that the support provided take into account the whole process of business development, i.e. both the issues concerned with product/service and the issues connected to the market. A long-term commitment, cooperation between different actors and information about what support is available, are other aspects that are important for policymakers to consider in their design of public policies to support entrepreneurship. Finally, the importance of evaluative awareness must be emphasised from the very start.

Keywords

Public support programmes – Entrepreneurship policy – Early stages technology-based ventures – Entrepreneurship – Innovation – Innovation systems – Programme theory – Evaluation

Sammanfattning

Den här avhandlingen är en sammanläggning av 7 studier kring vilka en kapp med titeln "Entreprenörskapspolicy: offentligt stöd för teknikbaserade företag" har skrivits. De inkluderade studierna beskrivs kortfattat i slutet av den här sammanfattningen. Syftet med avhandlingen är att analysera skälen till varför statliga interventioner kan vara berättigade, vidare att analysera målsättningar, design och resultat av offentliga program för stöd av nya teknikbaserade företag/projekt och slutligen att identifiera såväl praktiska som forskningsintressanta implikationer för utformningen av framtida stödaktiviteter.

Avhandlingen baseras till största delen på olika typer av kvantitativa analyser av Stiftelsen Innovationscentrum (SIC) (studie 2-6). Förutom detta ingår en konceptuell studie där ett ramverk för att utvärdera inkubatorer, främst ur ett "best practice" perspektiv, har tagits fram (studie 1). Slutligen har jag inkluderat en pågående uppföljningsstudie av Vinnovas program Vinn Nu (studie 7).

Avhandlingen förespråkar en bred syn på begreppet entreprenörskapspolicy, där syftet med stödet är att underlätta för företag/projekt att koppla upp sig mot relevanta innovationssystem där de kan säkra sin tillgång på externa resurser. Med utgångspunkt i ett sårbarhetsperspektiv visar avhandlingen att offentligt finansierade program som stödjer entreprenörskap kan motiveras genom att de små och nystartade företagens resurser är begränsade och eftersom riskerna ofta gör att intresset från privata aktörer att gå in i dessa företag är lågt. Avhandlingens praktiska implikationer är bland annat att det stöd som riktas till de allra tidigaste utvecklingsfaserna i syfte att kvalificera idéer bör vara brett. Däremot kan ett mer selektivt urval vara fördelaktigt i något senare utvecklingsskeden och för mer specialiserade stöd. Vidare visar de inkluderade studierna på behovet av att se till hela företagets utvecklingsprocess. Det innebär bland annat att det är nödvändigt att kombinera hårt och mjukt stöd och att lika vikt läggs vid produkt- och marknadsutveckling. Offentligt stöd bör också vara långsiktigt, och samarbete mellan olika stödprogram är viktigt, inte minst med avseende på information om vilka stöd som finns och hur, var, när och av vem dessa kan sökas. Slutligen understryks vikten av att stödprogram redan från början bör ta hänsyn till utvärderingsaspekter.

Följande studier ingår i avhandlingen:

- Studie 1, Bergek & Norrman "Incubator best practice: A framework", *Technovation* (2008) vol 28, s 20-28. Studien fokuserar på företagsinkubatorer, den är konceptuell.
- Studie 2, Norrman, Klofsten, & Sundin (2007). "Which New Venture Ideas Get Public Sector Innovation Support? A Study of Early Stage Financing From a Supply Side Perspective". In Groen, Oakey, van der Sijde & Kauser (Eds.), *New Technology-based firms in the new millennium*, vol 5, kapitel 7, s. 89-108. Oxford, Elsevier. Studien är baserad på programspecifika data rörande SICs villkorslån.
- Studie 3, Norrman & Klofsten "Seed funding for innovative ventures: A survey of selection mechanisms of a public support scheme" *Journal of Entrepreneurship and Innovation*, vol 9, nr 1, s. 11-19. Studien är baserad på programspecifika data rörande SIC:s villkorslån.
- Studie 4, Norrman, Klofsten & Bergek "Public innovation support and innovative ideas" Studien är baserad på programspecifika data rörande SICs innovationsbidrag och den är presenterad på "Babson-Kauffman Entrepreneurship Research Conference" 2005 i Boston.
- Studie 5, Norrman & Bager-Sjögren "Public Support to Innovative Ventures: Does it have any Impact?" Studien är baserad på programspecifika data rörande SIC:s villkorslån, vilka har kompletterats med offentliga bokslutsdata. Studien är presenterad på "Nordic Conference on Small Business Research" i Stockholm 2006, och den inkluderade versionen är omarbetad och ska skickas in till en akademisk tidskrift.
- Studie 6, Norrman & Klofsten, "What can be expected from a Public Venture Support Programme?" Studien är baserad på en enkätundersökning till företag som fått villkorslån från SIC. Den är presenterad på "High-Technology Small Firms-" konferensen i Manchester 2007. Den inkluderade versionen är omarbetad och befinner sig nu under granskning för en akademisk tidskrift.
- Studie 7, Norrman & Klofsten, "Some findings from the ongoing study of the Vinnova Vinn Nu programme". Studien är baserad på en enkät och intervju studie med de företag som fått Vinn Nu stöd från 2002 och framåt, studien är pågående.

Lists of figures, tables and abbreviations

Figures

- Figure 1 The parts and components of a public entrepreneurship support programme, p. 4 and p. 72.
- Figure 2 The scope of policies for facilitation of early stage technology based ventures p. 24
- Figure 3 Some publicly funded support actors in Sweden, p 29.
- Figure 4 The goal of the public support to TBVs, p. 68.
- Figure 5 Selection strategies, p. 74.

Tables

- Table 1 Allocation of SIC programme funding. Source: SIC (2004), p. 43.
- Table 2 Databases used and their content, p. 47-48.
- Table 3 Example of high-level goals and targets of two public support programmes, p. 70.
- Table 4 Examples of support models of public support programmes, p. 73.
- Table 5 Examples of selection criteria of public support programmes, p. 76
- Table 6 Examples of outcomes of public support programmes, p. 84.

Abbreviations and acronyms

ALMI	ALMI Företagspartner AB, see section 2.7.1
CIP	Competitiveness and Innovation Framework Programme, launched by the Commission of the European Communities
COM	Publication/report from the European Commission
ICT	Information Communication Technology
IPR	Intellectual Property Rights
IS	Innovation System, see section 2.2
NUTEK	The Swedish Agency for Economic and Regional Growth, see section 2.7.1
RQ	Research question
SIC	Sweden Innovation Centre In Swedish Stiftelsen Innovationscentrum, see section 3.3.1
SMART	Specific, Measurable, Attainable, Realistic and Timely
SME	Small and Medium sized Enterprises, see section 2.3
TBV	Early stage technology-based venture, see section 2.4
VC	Equity-based venture capital finance
Vinn Nu	Programme for innovation support supplied by the Swedish agencies Vinnova and Energimyndigheten (Swedish Energy Agency), see section 3.3.2
VINNOVA	The Swedish Governmental Agency for Innovation Systems, see section 2.7.1

Table of contents

Acknowledgements	IV
Abstract	VI
Keywords	VI
Sammanfattning	VII
Lists of figures, tables and abbreviations	IX
Figures	IX
Tables	IX
Abbreviations and acronyms	X
Table of contents.....	XI
1 Introduction	1
1.1 Model for analysis and generation of research questions	3
1.2 Structure of the thesis	7
2 Frame of reference.....	8
2.1 The concepts of entrepreneurship and innovation	8
2.1.1 Entrepreneurship	8
2.1.2 Innovation	9
2.1.3 Conclusion on Entrepreneurship and innovation.....	9
2.2 The entrepreneurial context.....	10
2.3 Public policy to support TBVs	12
2.4 Early stage technology-based ventures	15
2.4.1 TBV characteristics.....	17
2.4.2 TBVs and their financing	19
2.4.3 The scope of public support programmes for TBVs.....	22
2.5 Rationales for- and use of public support	24
2.6 Policy theory – goal for action rather than science	27
2.7 The national context of support to TBVs and the present Swedish situation	28
2.7.1 National support actors.....	28
2.7.2 The current Swedish situation.....	30
2.8 Summary of the frame of reference	31
3 Method and sample characteristics	33
3.1 Prologue (or why I ended up studying public support to TBVs)....	33
3.2 Reflections on science and research strategy.....	34
3.2.1 A scientific work	34
3.2.2 The view of the surrounding reality	35
3.2.3 The issue of objectivity	36
3.2.4 Some reflections on the techniques and methods used....	37
3.2.5 Quantitative analysis.....	39

3.2.6	Summary of my reflections over science and research strategy	40
3.3	Choice of objects for the study and characteristics of the programmes studied	41
3.3.1	Sweden Innovation Centre	42
3.3.2	The Vinnova Vinn Nu programme	44
3.3.3	Incubators	45
3.3.4	Overview of the empirical data	47
4	The process and the papers.....	49
4.1	Paper 1, Incubator best practice: A framework.....	49
4.1.1	History of paper 1	49
4.1.2	Summary of paper 1	50
4.2	Paper 2, Which new ventures get public sector innovation support? A study of early-stage financing from a supply side perspective ..	52
4.2.1	History of paper 2	52
4.2.2	Summary of paper 2	52
4.3	Paper 3, Seed funding for innovative ventures: A survey of selection mechanisms of a public support scheme.....	54
4.3.1	History of paper 3	54
4.3.2	Summary of paper 3	54
4.4	Paper 4, Public innovation support and innovative ideas	56
4.4.1	History of paper 4	56
4.4.2	Summary of paper 4	56
4.5	Paper 5, Public Support to Innovative Ventures: Does it have any Impact?.....	58
4.5.1	History of paper 5	58
4.5.2	Summary of paper 5	58
4.6	Paper 6, What can be expected from a Public Venture Support Programme?	61
4.6.1	History of paper 6	61
4.6.2	Summary of paper 6	61
4.7	Paper 7, Some findings from the ongoing study of the Vinnova Vinn Nu programme	64
4.7.1	History of paper 7	64
4.7.2	Summary of paper 7	64
5	Discussion and analysis	66
5.1	How can public programmes to support TBVs be justified, and what are their goals?	66
5.1.1	Rationales for- and purpose of public TBV support programmes	66
5.1.2	Goals and targets of support programmes	69
5.1.3	Summary on RQ 1	71
5.2	What are the parts and components that constitute public support programmes to support TBVs?	71
5.2.1	The support model components	72
5.2.2	Summary on RQ 2a.....	73
5.3	How, and on what grounds are TBVs selected for support?.....	74
5.3.1	The incubator selection process	74

5.3.2	The Selection of the SIC programme and the Vinn Nu programme.....	76
5.3.3	Additional factors affecting selection; ability to communicate the idea	78
5.3.4	Additional factors affecting selection; Credibility	79
5.3.5	Summary on RQ 2b.....	80
5.4	What outcomes can be expected from public programmes to support TBVs, and how can it be evaluated?	81
5.4.1	Analysis of what could be expected as outcome of public support programmes.....	81
5.4.2	Outcome evaluation	83
5.4.3	New methods for evaluation	86
5.4.4	Summary of RQ 3a	87
5.5	How does the support provided to TBVs within public programmes correspond to the support that is needed and demanded by the TBVs?.....	88
5.5.1	Summary of RQ 3b	89
5.6	What are the main implications for research and practice with regard to the design of public programmes to support TBVs?.....	89
5.6.1	Facilitating IS linkage requires attention to the whole process of development.....	89
5.6.2	Conformation, programme theory and evaluative awareness	90
5.6.3	Long-term commitment, information and cooperation	91
6	Conclusions and implications	93
6.1	Main theoretical contributions	93
6.2	Implications for research and policy	94
6.2.1	Implications coupled to rationales and goals	95
6.2.2	Implications coupled to the support provided	96
6.2.3	Implications coupled to outcome and evaluation.....	97
6.3	Further research	99
7	References.....	102
Papers 1-7		

1 Introduction

The cover of this book is decorated with a picture of two almost fledging peregrine falcons that have been hatched in an incubator. The peregrine falcon is a highly developed and specialised hunter. As a fully grown adult, it can dive at a speed of 250 km/h. However, due to toxic waste and other forms of environmental pollution this species was close to extermination. Today, through the support of enthusiast organisations, it has started to recover.

This study however is not about birds. Instead, its scope is early stage technology-based ventures and the policy actions aimed at facilitating their emergence and development. What then have the peregrine falcons on the book cover to do with public venture support? From my point of view, this connection is obvious. Firstly, both have a high potential for developing into advanced and powerful creatures. Secondly, in order to do so, they need a friendly environment. As both technology-based ventures and peregrine falcons are vulnerable during the earliest stages of their development, they can benefit from support. Thirdly, it is a common apprehension that both peregrine falcons and new technology-based ventures enrich their respective faunas, and that there are fewer of them than is desired. Finally, a picture says more than 1000 words. People, who begin their entrepreneurial journey for the first time, may feel from time to time the sense of confusion that we can see in the face of the falcon on the right. During the work with my thesis, more than once, has this feeling also been mine. In such situations, it is good to receive a helping hand.

Early stage technology-based ventures (abbreviated TBVs from here on)¹ is a subject that has been targeted by a substantial number of studies (cf. Storey & Tether, 1998b). It has been shown that these firms are often spinoffs from universities, institutes or other firms (Lindholm-Dahlstrand, 2004), that they are regarded as an important complement to the larger firms, and that they are associated with special characteristics that differentiate them from other small firms in general (Cooper & Bruno, 1977; Storey, 1994; Jones-Evans, 1997). TBVs, if they are concerned with innovative products or services, are said to have the potential to “fundamentally transform the ways in which societies and markets operate” (Storey & Tether, 1998b, p 1057). Hence, from a societal point of view, they manifest entrepreneurship and innovation, and are regarded as important contributions to growth and societal development, which explains why various governmental policy programmes over the years, have been designed to facilitate them (Vedin, 1993; Storey, 1994; Heydebreck, Klofsten, & Maier, 2000; North, Smallbone, & Vickers, 2001; Jaffe, 2002; Lindholm-Dahlstrand & Klofsten, 2002; Audretsch, 2004; COM, 2005). If policy declarations at different levels are followed, these actions can be

¹ All key-concepts mentioned will be discussed and declared in the frame of reference (chapter 2). Early stage technology-based ventures (TBVs) per se are discussed in section 2.4.

expected to continue in the future too (COM, 2005; OECD, 2006; Regeringskansliet, 2006; Edling, Hermansson, Nilsson, & Nordborg, 2007).

Public policy², which aims especially to support entrepreneurship, just like the research area of entrepreneurship in itself, is multi-faceted (Lundström & Stevenson, 2005; 2007). The concept can hence be said to include almost everything from tax-regulations and education to specific programmes that provides finance and business support to individual ventures. These activities (generally after a more or less thorough process of selection) can be supplied directly by public actors or indirectly through private actors. In addition, the rationales underlying the various policy interventions differ. With regards to research on this area, some aspects are well investigated while others are more unexplored. As an example, the area of SME policy has been investigated in several studies (cf. Chrisman & McMullan, 2000; Audretsch, 2002; Storey, 2003), but still there seems to be more to learn. Lundström and Stevansson (2002; 2005) argue that the policy area that comprises the earliest stages of venture development, which they label as entrepreneurship policy, is still unexplored. One explanation could be that the area of policy development has been dominated by consultants, and has not been seen as attractive by researchers (Storey, 2000, 2004). There also seems to be a research gap with regard to particular activities, such as financial support directed to the earliest stages of venture development (Klofsten, Jonsson, & Simón, 1999; Meyer, 2005). It is notable that the most of the present studies in this area are based upon questionnaires, i.e. self-estimations, which generally views a positive impact of the programme surveyed (cf. Klofsten et al., 1999; Chrisman & McMullan, 2000). As entrepreneurship policy focus on micro level rather than on the macro level (Lundström & Stevenson, 2005), the needs, attitudes and motivation of the entrepreneurs are considered to be important. However, on many occasions, this seems to have been overlooked (Nouira, Klofsten, & Lindholm-Dahlstrand, 2005). Furthermore, the longitudinal extension of most studies is often limited, something which is regarded as negative from a learning perspective, as effects need time to emerge (Rush, Bessant, & Lees, 2004; Lundström & Stevenson, 2005).

Irrespective of the level of theoretical development, the area of public policy intervention into private venturing has become an issue for discussion during the latest decades. It has been stated that the rationale for public intervention has to be strong (Vedin, 1993; Audretsch, 2002). Some argue that public support is an important complement to the private financial market (Oakey, 2003), while others argue that the problem is to be found among the ventures themselves, as they have an inability to convince investors to get involved in their businesses (Mason & Harrison, 2002; 2004). There also have been arguments against the socioeconomic efficiency of public interventions (cf. Storey, 1994). Furthermore, both from policy makers and business developers, there is a demand for more knowledge of how to design and create efficient

² Public policy, in case of public support interventions directed to private ventures are discussed in section 2.3

support instruments (Storey, 2004). This demand covers both content, reliable evaluations (COM, 2005) and the identification of early, consistent, reliable and cheap information that can serve as base for such evaluations (Mosselman, Prince, & Kemp, 2004).

To address the above listed research gaps, and to gain more knowledge of the area of policies for the facilitation of TBVs, the purpose of this thesis has been defined as follows:

To analyze the rationales, goals, design and outcomes of public programmes which aim to support TBVs, and to identify implications for research and for the practical design of future support efforts within this area.

By means of the purpose formulated above, my aim is to contribute to the theory development in the area of policy to support entrepreneurship and the creation new ventures. I also aim to contribute to the practical knowledge and the understanding of public policy directed to early stages ventures.

1.1 Model for analysis and generation of research questions

Lundström & Stevenson (2005) advocate that policy measures within the frame of entrepreneurship policy should focus on the individual entrepreneur. In my opinion, this implies a bottom-up perspective. Hence, knowledge obtained from support programmes directed to early stage ventures, or from the individuals or ventures that have experienced the support, seems to be a good way to proceed in order to learn about this type of policy. In the case of this thesis, the findings are based on the analysis of three types of support providers, namely Sweden Innovation Centre (SIC), The Vinnova programme Vinn Nu, and the type of support given by incubators.³

To be able to fulfil the abovementioned purpose, I will start by following a generic model of how public programmes are commonly formed. Within the literature (cf. Vedung, 1998; Salmenkaita & Salo, 2002), a policy intervention, for example, a programme to support the emergence of innovative ventures, can be divided, as suggested in Figure 1, into three main parts, which in turn include components that can be used to distinguish different programmes from each other. These three parts are: (1) the goal of the programme, (2) the programme model, i.e. the treatment given by the programme and (3) the expected and/or actual outcome of the programme. These boxes are coupled to and interdependent on each other and they are ideally aligned through what can be labelled as programme theory⁴ (Hoogerwerf, 1990; Vedung, 1998), i.e. the arrow marked in grey in Figure 1. The research questions are formulated

³ Sweden Innovation Centre (SIC) is described in section 3.3.1 (and in 2.7), additionally it is treated in the papers 2, 3, 4, 5 and 6. The "Vinn Nu" programme is described in section 3.3.2 and treated in paper 7. The incubator phenomenon is described in section 3.3.3 and dealt with in paper 1.

⁴ The concept "programme theory" is discussed in section 2.6.

to explain the model, and to fill it with content. As shown by the figure, the first research question is coupled to the content of the goal box. In the next step, the box of the support model is in focus, and after this, the outcome box. Finally, the model as a whole and the implications coupled to the findings are dealt with.

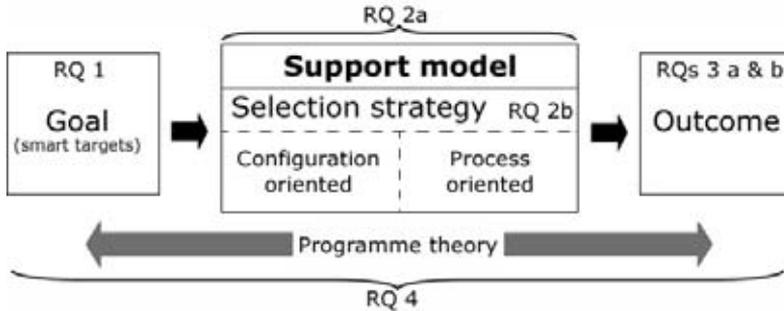


Figure 1, The parts and components of a public entrepreneurship support programme

To begin, before public money is to be allocated to private ventures, there ought to be good, or as a minimum, specified reasons for doing so (cf. Vedin, 1993; Audretsch, 2002), i.e. the rationales for intervention. Based on this, it seems important to investigate what justifies public intervention in private venturing. The next aspect of interest is the goal(s) of the intervention. For example, the goal(s) of a specific support programme can be assumed to be ruled by higher-level goals, i.e. goals that are formed on a more general policy level. Such goals may be to create the societal growth and development that is desired by policymakers, or to facilitate entrepreneurship and innovation on a general level. Goals on an operational level are also something that it seems meaningful to investigate, as they might affect both the support provided and the outcome of the programme. To be able to fulfil the above stated purpose my first research question therefore is:

RQ1 – How can public programmes to support TBVs be justified, and what are their goals?

The next part of the model addresses the support given. To be able to find out what characterizes a good financial support programme or a best practice incubator, the components of the model must be analysed and made clear. This therefore forms research question number 2a.

RQ 2a – What are the parts and components that constitute public support programmes to support TBVs?

Besides the main components of the support, it is interesting to find out to which ventures the support is given and the factors that affect the decision to support or reject a venture that applies, i.e. the selection mechanisms. Since there has been a large focus on the area of venture capital, there have been

substantial contributions made on how venture capitalists select their investment objects (cf. Zacharakis & Meyer, 2000; Baum & Silverman, 2004). The selection process in the area of incubators and science parks has also been studied, and in this case, long lists of indicators and criteria for selection have been suggested, see for example the review of the appended paper 1. However, when it comes to publicly funded support directed to the very earliest phases of venture development, knowledge about selection strategies seem to be scarcer. Based on the above, research question 2b can be formed.

RQ 2b – How, and on what grounds are TBVs selected for support?

The final box concerns the outcome. What outcome can in fact be expected from support programmes directed to early stage ideas? This is coupled to the intentions of the programme. Additionally, some factors can, based on the literature, be listed as possible outcomes: Firstly, it is argued that motivation or driving forces are important in succeeding to build a profitable venture (Klofsten, 1992; Davidsson & Klofsten, 2003). It has also been shown that motivation could be increased by rewards (Naffziger, Hornsby, & Kuratko, 1994; Choo & Wong, 2006). Hence, being granted external money ought to increase the motivation to continue the work. Credibility is another factor that might be a fruit of public support (Klofsten et al., 1999; Lerner, 2002). In my licentiate thesis (Norrman, 2005), I argued that public support ought to develop firms so that they become attractive to private investors, i.e. public support ought to facilitate investment readiness (Mason & Harrison, 2002; 2004). Finally, Birley (1985) and Ramachandran & Sougata (2006) mention that a surrounding network is a crucial factor for new ventures. Therefore, this factor could also be regarded as a desired outcome.

The next area of interest with regard to the outcome is the issue of evaluation. To be able to learn from past efforts and experience and thereby also be able to distinguish between which parts of a programme that deserve continuation in future systems and which parts are it is better to drop, the outcome need to be evaluated. By tradition, this has been an area for programme owners and consultants rather than an issue for researchers (Lundström & Stevenson, 2005), although substantial contributions have been made by researchers such as David Storey (cf. Storey, 2000). However, the fact that the academic community has shown little interest in the area of policy development is said to be disappointing (Storey, 2004, 2000). In an earlier paper Storey & Tether (1998b) express a demand for more research into the issue of public venture finance, and argue that evaluation of the effectiveness of governmental support schemes in Europe is needed. Other sources have requested improved evaluations as well as more knowledge about this (cf. Lundström & Stevenson, 2002; Mosselman et al., 2004; OECD, 2006). Research gaps have been noted also for the area of incubator support. Mian (1997) as well as Bhabra-Remedios & Cornelius (2003), have commented on the need for increased knowledge of how to evaluate incubator performance. This also holds for the Swedish incubator system as well, where Lindelöf & Löfsten (2004) emphasize that more knowledge is needed. Additionally, Storey

and Tether (1998b) stress the importance of an understanding and awareness of TBV's special characteristics, and the importance of considering these within the support actions.

According to more recent Swedish contributions, there seems to be room for new or improved solutions (de Neergaard, 2004; Larsson, 2006; Regeringskansliet, 2006). Moreover, it is argued (Regeringskansliet, 2006) that the basic goal of evaluation is that of learning, and that learning can be improved by the use of new methods of evaluation. This can be expressed as research question 3a.

RQ 3a - What outcomes can be expected from public programmes to support TBVs, and how can it be evaluated?

In a study of early stages finance, it is emphasised that the needs, attitudes and motivations of the innovators/entrepreneurs at an individual level is commonly overlooked (Nouira, 2005). Moreover it is shown that the entrepreneurs demand/need⁵ for various kind of support activities not always are met by the support given (Gibb, 1987; North et al., 2001; Lindholm-Dahlstrand & Klofsten, 2002). Hence, it can be interesting to add a research question 3b

RQ 3b – How does the support provided to TBVs within public programmes correspond to the support that is needed and demanded by the TBVs?

In order to reach conclusions and to be able to improve future support efforts it is important to learn from what has been done. The last research question will therefore read:

RQ 4 - What are the main implications for research and practice with regard to the design of public programmes to support TBVs?

Taken together, these four research questions, along with the model for analysis, will help to answer the purpose presented above.

The research questions are addressed as follows: RQ 1 is (mainly) treated within the frame of reference (chapter 2). RQ 2a, is considered partly in chapter 2, and partly within the sample characteristics (section 3.3) of the covering paper and in the sample characteristics of the papers respectively. RQ 2b is dealt with in chapter 2 and in the papers 1, 2, 3 and 4. RQ 3a is analysed in papers 1, 5, 6 and 7. RQ 3b is analysed in paper 6 and to some

⁵ "Demands" refer to measures that are demanded (or emphasised) by the ventures, in this case measures and suggestions retrieved from e.g. questionnaires and interviews. "Needs" refer to measures that according to theory are argued to be of relevance.

extent in paper 7. RQ 4 is dealt with in all papers. Finally, all research questions are analysed and synthesised in chapter 5 and 6.

1.2 Structure of the thesis

The thesis begins with the preceding introduction. The reader will then be taken through the frame of reference, where the theoretical foundation of this thesis is displayed. This section will also be used to explain and define the concepts that are of importance for this study. Then the method and research design of the thesis will be discussed, along with the ontological standpoints. After this, some sample characteristics of the programmes studied will be given. This will be followed by summaries of the papers included. Then, I will analyse the research questions and try to reach some conclusions. Finally, I will present some overall conclusions and some implications of what can be learned through this study.

2 Frame of reference

Within this frame of reference, I will explain and define concepts and theories that are of central importance for the understanding of the purpose of this thesis. I will start by discussing the concepts of entrepreneurship and innovation. Then I will describe how I regard the context in which both the TBVs and the public actors that support them act and interact.

The next issue is the term “policy” per se. Even if it is delimited to the area of venture support, this term is wide and can comprise almost everything from taxes and education to specific programme measures. I will then describe and define the TBVs that are targeted by the various policy actions, and after this, I will go deeper into the policies that focuses on the TBVs, and look also at the rationales, according to which policy interventions are based. After this, I will give a brief overview of the current Swedish actors and the contemporary Swedish situation. Finally, I will provide a brief summary of this chapter.

2.1 The concepts of entrepreneurship and innovation

Entrepreneurship and innovation emerge as keywords in the discussion of support of early stage ventures. When reading about policy to support TBVs, one meets with citations such as “entrepreneurship is a vital force in the economies of developed countries” (Audretsch, 2002, p. 2), and “Our future depends on innovation” (COM, 2006, headline p. 2). Furthermore, these words, entrepreneurship and innovation, are often used together and, more or less, synonymously. An example that can be mentioned is the CIP 2007-2013, where an “entrepreneurship and innovation programme” is proposed (COM, 2005, p. 3). However, what do the terms innovation and entrepreneurship represent? In this section, I will try to shed some light on the meaning of these concepts and of how I have considered them in the context of this thesis.

2.1.1 Entrepreneurship

The term entrepreneur is French and derives from the verb “entreprendre” (to undertake) that can be dated approximately a thousand years back in history. The word “entrepreneur” itself appeared for the first time, in a dictionary in 1437, and refers to people who are active and undertake tasks. Within research, the concept had its major modern “break through” by Joseph Schumpeter in 1934 (Landström, 2005a). According to Schumpeter (1934), entrepreneurship (and innovation) is coupled to economic development, and manifested by the carrying out of new combinations. “The carrying out of new combinations we call ‘enterprise’; the individuals whose function it is to carry them out we call ‘entrepreneurs’” (p. 74). Entrepreneurship is a multi-dimensional concept, and the domain of research (if there is one) is multi disciplinary (cf. Audretsch, 2002; Landström, 2005b; Stevenson & Lundström, 2007). Thus, since the definition given by Schumpeter, a number of attempts have been made to define the concept of entrepreneurship, some of which are

wide and others narrow. The researchers Shane and Venkataraman (2000), for whom the recognition of opportunity is the central aspect, could be mentioned as one example. Another example is Drucker (1985), who argued that entrepreneurship is about utilising change, by response and by the exploitation of opportunity. Utilising change is central also for Audretsch (2002), who regards entrepreneurs as agents of change. To Gartner, entrepreneurship is about the creation of new organisations (1988). The above mentioned are merely a few examples, and authors such as Lundström & Stevenson (2005) and Landström (2005a) has made more comprehensive lists. Davidsson (2003) have summarised the present definitions, and concludes that there are three main ways of defining entrepreneurship; (1) coupled to the characteristics of the entrepreneur, (2) coupled to the entrepreneurial process, and (3) coupled to the results of entrepreneurship. According to Bjerke (2005), most definitions contain a mixture of these three. For the purpose and context of this work, it does not seem meaningful to reach a very narrow definition. Neither does it seem important to try to distinguish between which of the ventures in my databases may be entrepreneurial, in the most pure, definitional sense, from those that are not.

2.1.2 Innovation

The word “innovation”, according to dictionaries, comes from the Latin “innovatio” or “innovo”, which means to renew, or to make something new. Neither in this case, can I see a point in seeking a narrow definition. I will therefore follow the Schumpeterian definition above “carrying out of new combinations”. This expression may include “new combinations” of new or already existing knowledge (Edquist, 2004). Schumpeter (1934) mentioned five sources of innovation: (1) a new good or new quality of good, (2) a new method of production, (3) a new market, (4) a new raw material, and (5) a new organization. Drucker (1985, p. 27) also couples innovation and entrepreneurship, and states that “Entrepreneurs innovate. Innovation is the specific instrument of entrepreneurship. It is the act that endows resources with a new capacity to create wealth.” For Drucker (1985) innovation utilises change, since change provides opportunity, and he concludes that social innovations are generally of greater impact than technical ones. Additionally, it is important to emphasise that Schumpeter made a distinction between invention and innovation, and regarded invention per se as of no economic value, unless the invention was carried into practice. Commonly, and in the context of this study, “carrying into practice” implies commercialisation in one way or another. In other contexts, however, I would not exclude the use or utilisation of an invention without economic transactions as ways to carry an invention into practice.

2.1.3 Conclusion on Entrepreneurship and innovation

To conclude, entrepreneurship and innovations are concepts that are intimately linked (cf. Lundström, Almerud, & Stevenson, 2008). However, entrepreneurship research seems to have a stronger focus on individuals, ventures/firms and processes on a micro level (cf. Shane & Venkataraman,

2000; Davidsson, 2003; Lundström & Stevenson, 2005). Innovation research, on the other hand, seems to have stronger bonds with the development of new technologies on a meso-level, e.g. innovation systems (cf. Edquist & Johnson, 1997) and the development of new products primarily within established firms. This is shown by the paper by Salmenkaita and Salo (2002), in which it is argued that innovation policies aim at influencing actors who are involved in the development and commercialisation of technologies.

The concepts of entrepreneurship and innovation, especially in the earliest stages of development, are intimately coupled and complicated to separate. This is because the same individuals commonly represent the venture and its entrepreneur(s)/innovator(s). Additionally, it is my conviction that the presence of entrepreneurship is needed in the process of transforming an invention into a successful innovation. The citation below, which was found in the CIP 2007-2013, strengthens the view of the close relationship between the concepts, as its way of regarding innovation has large similarities to how entrepreneurship is regarded in the above definitions.

“Innovation is a business process connected with exploiting market opportunities for new products, services and business processes.” (COM, 2005, p. 5)

Hence, for the sake of this thesis, I see no point in distinguishing between the concepts. Instead, I will follow Schumpeter and regard the process of entrepreneurship as synonymous to the process of innovation. For the sake of this thesis, the essential, simply expressed, is about attempts to carry (business) ideas into practice.

2.2 The entrepreneurial context

According to authors such as Barney (1991) and Klofsten (1992), firms need both to get hold of, and to be capable of utilising crucial resources in an efficient way, in order to reach a stage of sustainable development. Such resources include the “tangible and intangible assets a firm uses to choose and implement its strategies” (Barney, 2001, p 54). As examples of resources that can be regarded as crucial, can be mentioned scientific/technological research or know-how, financing, market and customer acceptance, network, advice and workforce (Barney, 1991; Klofsten, 1992; Van de Ven, 1993; Rickne, 2000).

Barney (1991) divides these resources into three main types; physical capital, human capital and organizational capital. Klofsten (1992) sets out eight cornerstones⁶ that together form a platform from which the firm can act more independently. These cornerstones are coupled to the firm, the individual(s) within the firm and the external actors. The views of Klofsten and Barney respectively, have differences as well as similarities, and common for both of them is the notation that some of these resources are found within

⁶ See also paper 7 for a thorough description of the “business platform”.

the firm or its staff, while others must be obtained from the surrounding environment. As an example, a firm that needs more capital to finance its product development has to obtain this resource from an external source, such as its customer, a bank or a venture capitalist. On the other hand, if the firm needs more knowledge/competence, this can be obtained, for example by trial and error, reading, or from external actors, i.e. through hiring new personnel or through activities such as education, training and advice.

To conclude, “new technologies are seldom if ever developed by a single firm alone in the vacuum of an institutional environment” (Van de Ven, 1993, p. 214). In fact, it has been shown that early stage ideas seriously start developing when they become anchored to the world around (Klofsten, 2005). Hence, the development of a venture must be regarded as part of a larger context. This surrounding context, or infrastructure for entrepreneurship, as it has been expressed by Van de Ven (1993), is, referred to by others, as the surrounding innovation system (IS).

An IS is by Edqvist and Johnson (1997) defined as “all important determinants of the innovation process” (p. 60). According to these authors, this definition comprises organisations (players) as well as institutions (rules). They have divided these concepts since they play different roles in the IS. In an IS, “organizations are formal structures with an explicit purpose and they are consciously created. They are players or actors” (Edquist & Johnson, 1997, p. 47)⁷. With regard to the organisations, the authors distinguish between public and private ones. Universities, governmental agencies, patent offices, and science parks could be given as example of public organisations, while firms and industrial associations could be mentioned as example of private organisations. The relations and interactions among and between the organisations within the IS follows that of contemporary institutions.

The institutions hence constitute the rules of the game and in contrast to the organisations, they “develop spontaneously and are often not characterised by a specific purpose” (Edquist & Johnson, 1997, p. 47). These “rules” give guidance to the entrepreneur(s) and they are dynamic and change over time (Baumol, 1996). This is because the organisations within the system – the players – are influenced by, and influence the institutions.

Edquist & Johnson (1997) make a taxonomy of institutions and distinguish between formal institutions, such as laws and regulations, and un-formal, such as norms and practice. Furthermore, they make a distinction between basic and supporting institutions and between hard and soft institutions. The former refer to rules of a configurative nature and to restrictions of aspects of these, while the latter refer to binding or commanding rules versus the informal “rules of thumb”. Institutions can be complex and the market(s) is

⁷ This definition is similar to the one of Stinchcombe (1965) who defines organisations as “a set of stable social relations deliberately created, with the explicit intention of continuously accomplishing some specific goals or purposes.” (p. 142)

referred to as one example of an institution (set of institutions), in this case for the facilitation of exchange.

Applying an innovation system approach implies that the external resources, which are crucial for firms to expand growth and development, are inherent in the innovation system, and that these resources can be obtained by linking to - and becoming an active part of - the surrounding innovation system (Edquist, 2004).

In literature, several types of IS are mentioned, each of them suitable for different contexts and purposes. Furthermore, as will be described in the next section, different types of IS can be coupled to different types of policy interventions. There are two main principles for IS categorisation, those which are geographically based and those based on industrial sector/technology. Geographically based systems are divided into national IS, which are limited by national borders and regional IS, which are limited to certain geographical regions (Asheim & Gertler, 2004; Edquist, 2004). IS following the industrial sector are referred to as sectoral IS. These systems are based upon the shared knowledge and technology among the actors and networks within the sector (Malerba, 2005). If the system concerns “a particular technology or set of technologies” (Carlsson, 2004, p. 6) the denomination is a technological IS. Additionally to the above ways of limitation, Edquist (2004) mentions the activities of the system as a third way. However, he admits that such limitations often are complicated to implement.

2.3 Public policy to support TBVs

When entering the area of public policy, a range of concepts emerges. If we start with the concept of public policy, this embraces governmental actions, laws and regulations. The term policy per se is a matter of action, and could be defined as “the relatively stable, purposive course of action followed by an actor or set of actors in dealing with a problem or matter of concern” (Anderson, 2003, p. 2). Governmental intervention is hence “the mechanisms through which the government deliberately influences resource allocation decisions” (Salmenkaita & Salo, 2002, p 184). In this thesis, the focus is on those types of governmental policy interventions that aim to encourage and facilitate TBVs.

This type of interventions can be labelled as entrepreneurship policies. According to Gilbert, Audretsch & McDougall (2004), Audretsch (2004) Audretsch & Beckmann (2007) this policy area emerged as consequence of a change from capital to knowledge being the most competitive advantage of firms. They argue that this caused policy to change from being restricting into being enabling in its nature.

“...when competitiveness was generated from capital and labour, the policy response towards large enterprises was restricted in nature, while small business was targeted of preservationist policy. By contrast, when knowledge is the source of competitiveness in emerging markets, policy shifts towards enabling the start-up and growth of new enterprises, or what can be termed as entrepreneurship policy” (Gilbert et al., 2004, p 318).

Lundström and Stevenson (2002; 2005; 2007) have defined the concept “entrepreneurship policy” as the label for the type of policies and support programmes that primarily aim to encourage entrepreneurship, entrepreneurial activity and entrepreneurial environment. Their definition reads as follows:

“...we define entrepreneurship policy as policy aimed at the pre-start, the start-up and early post-start-up phases of the entrepreneurial process, designed and delivered to address the areas of motivation, opportunity and skills, with the primary objective of encouraging more people in the population to consider entrepreneurship as an option, move into the nascent stage of taking actions to start a business and proceed into the entry and early stages of the business”. (Stevenson & Lundström, 2007, p. 105)

According to the same authors, entrepreneurship policy focuses on individuals rather than on firms and it emphasizes climate and culture. Its instruments are advice, training, networking activities and the facilitation of start-up finance, seed capital and micro loans.

In order to bring structure to the various measures provided by the policy programmes, they can be divided into two main types; configuration-oriented and process-oriented support measures (Autio & Klofsten, 1998). The former refers to support measures in terms of “hard” facilities such as infrastructure, proximity to universities, research institutes and manufacturing industries, competently managed science parks/incubators, the supply of venture capital and other sources of funding. The latter, the process-oriented, refers to more “soft type” of support, such as support programmes directed towards the actual venture and its daily needs, e.g. different kinds of business advice, coaching, education and networking activities. This division is by no means absolute, as will be shown by the empirics. Most actors combine both types of support in one or another way.

The area of SME policy is a related to the area of entrepreneurship policy, and partly overlapping. According to Audretsch (2002); “SME policy typically refers to policies implemented by a ministry or government agency charged with the mandate to promote SMEs” (p 46). The scope of the SME policies comprises existing firms from 1 up to 250 employees (500 in the USA) and in

practice aims at increasing firm growth and growth in productivity (Audretsch, 2002).

The scope of entrepreneurship policy is somehow broader than SME policy. It is said to have a horizontal approach and therefore is coupled to other policies, such as education, employment and innovation policies, as well. According to Lundström and Stevenson (2005; 2007), in the venture development process, the scope of entrepreneurship policy comes prior to the scope of SME policy, as entrepreneurship policy comprises the earliest stages of venture development. To Lundström and Stevenson, the early stages comprises the awareness phase, the nascent phase, the start-up phase and the post start-up phase, i.e. up to 42 months after the firm is started.

Besides SME policy, there are other related policy areas, such as innovation policy and technology policy. Innovation policies are, defined as “policies that are intended to influence the behaviour of both public and private organisations in the development and commercialisation of new technologies” (Salmenkaita & Salo, 2002, p. 184). A more detailed definition is proposed by Lundström et al. (2008)⁸.

“Innovation Policy is primarily concerned with ensuring the generation of new knowledge and making Government investment in innovation more effective, improving the interaction between the main actors in the innovation system (e.g. universities, research institutes and firms) to enhance knowledge and technology diffusion and establishing the right incentives for private sector innovation to transform to knowledge into economic value and commercial success.” (Lundström et al., 2008, p. 10)

The scope of this type of policy (Salmenkaita & Salo, 2002), is different than those of the entrepreneurship/SME policies. However, with regard to target groups, they partly overlap. According to Lundström et al. (2008) both policy areas strive to create economic growth and wealth, but their policy objectives differs, i.e. entrepreneurship policy aims at job creation, productivity improvement, competitive innovation and social inclusion, while innovation policy focuses more on productivity improvement and wealth creation. With regard to the overlap, it must be emphasised that even if the bulk of the resources spent on innovation/technology policy interventions is presumably allocated to firms with less than 500 employees, the focus of these types of policies is on industrial sector/technology rather than on firms or individuals.

To better understand the scopes of innovation and technology policies, the above mentioned theories of IS could be used. Following the IS approach implies that different policies fit with different types of IS. Both

⁸This definition is according to Lundström et al. (2008) used in sources from OECD and The Commission of the European Communities

entrepreneurship- and SME policy actions are normally undertaken by national or regional actors, and aim to support their target groups on the national or regional basis (cf. Storey, 2003; Lundström & Stevenson, 2005; Audretsch & Beckmann, 2007). The SIC- and the Vinn Nu programmes, that is investigated in this thesis, can be mentioned as examples. These are (were) financed by governmental funds and support(ed) Swedish ventures on a national basis. The regional incubator Lead, in Östergötland, is financed by regional funds and aims at supporting ventures from the Östergötland region. If this is regarded from an IS approach, these actions are undertaken with the purpose of creating national and regional growth and development, and hence both the actors and their actions therefore reside within a national and a regional IS, respectively.

According to Rothwell & Zegveld (1984), innovation policies appeared during the seventies. According to Lundström et al. (2008) innovation policy derives from science and technology policy. Policies formed to support innovation on a more general basis, or the development of certain technologies irrespective of firm size and geographical location, seem (compared to entrepreneurship- and SME policies) to have stronger bonds with the technology IS and sectoral IS discussed above. Examples of such policy programmes could be policies aiming to increase the commercialisation of research within certain technologies or the stimulation of technology exchange or transfer between different units.

2.4 Early stage technology-based ventures

This thesis concerns TBVs and thereby that part of entrepreneurship (and innovation) policy⁹ that is directed in particular to this type of venture. Hence, in order to be able to discuss policy interventions that target this type of ventures, the TBV concept has to be discussed and defined. When examining the literature about firms, ventures or even projects that are based on new technology (commonly mentioned as NTBFs), knowledge, high technology, innovation or R&D, it is soon confirmed that the confusion over what is considered as what is large (Storey & Tether, 1998a; Rickne & Jacobsson, 1999; Lindholm-Dahlstrand, 2004). There is a range of more or less differentiated opinions about both definitions and denominations.

‘New’ may refer to new technology as well as to new by means of age of the firm, and both meanings are relevant in the case of this study. The former implies innovativeness and this concept is discussed above. The latter is connected to the focus of this thesis – early stage ventures. Hence, ideas, ventures, projects and firms, which are young or undeveloped (i.e. those in their earliest phases of development) will henceforth, be referred to as ventures.

⁹ According to Lundström and Stevenson (2005) Lundström et al.(2008) the types of policies that focus on innovative entrepreneurship is labelled as “holistic” entrepreneurship policy.

Being in an early phase of development implies that the venture is vulnerable (Stinchcombe, 1965; Klofsten, 1992; Lundström & Stevenson, 2005). Within the literature (cf. Lundström & Stevenson, 2005) the early phase commonly is defined by time-spans, for example a certain number of months after start-up. Being in an early phase and being young is often correlated, but since ventures are heterogeneous, the time-span of immaturity may differ substantially, depending on individual characteristics (Klofsten, 1992). Klofsten (2005) explains this by classifying ideas in terms of their concreteness and how well they are anchored on the market. He argues that an idea can be either concrete or abstract in the eyes of the market. A concrete idea is generally signified by the presence of a developed product. In cases where there is a developed product, through which the goods can be explained and understood, the concreteness of the idea is high. However, it is commonly complicated to communicate something from which a developed product can be achieved only after several years of research; hence, the degree of concreteness is low. An idea that is highly anchored is signified by a pull from its market, as such idea match to the needs of its users. Ideas that are less anchored face the opposite – they have to be pushed out to the market, which is both risky and expensive.

Taken together, this implies highly different prerequisites for market launch. As an example, a research based university spinoff venture might need several years to reach - or in the worst case, to create - a market, while a corporate spinoff that holds a developed product, can reach the market within a few months (see also the TBV characteristics listed below). This implies that it is more relevant to regard the degree of business maturity than time in case of months passed after firm start, when delimitating the concept of early stage. Hence in this thesis, early development or early stage/phase is, defined as beginning “with the realisation of the idea whereby one or more founders take concrete action to set up a commercial enterprise. The process is said to be concluded when a business platform has been established” (Klofsten, 1997, p 149).

The term “technology-based” can embrace everything from science-based by means of high-technology spinoffs from universities and research institutes to more basic meanings of technology-based in general, but still have their focus on the technology of the product or service. Such ventures are also referred to as being knowledge-based, although this concept is wider than technology-based. According to Lindholm-Dahlstrand (2004), the term knowledge-based is connected to human capital in general and not to technology per se, which implies that it also comprises products or services from skilled individuals such as art directors, architects and lawyers. One can object to both these labels, as it is possible to argue that most firms are based on some kind of knowledge and some kind of technology. The ventures studied in this thesis have in common the fact that they are developing their ideas into income generating businesses. The term “development intensive” would therefore be a more accurate description, although in this context, I prefer to label my target group by the more commonly used term, “technology-based”.

According to Cooper and Bruno (1977), the competitive edge of this type of firm is based on the knowledge and skills of the founders. The same perspective is used in the definition chosen for this study, in which a technology-based venture is defined as ...

“... one whose strength and competitive edge derives from the engineering know-how of people who are integral to the firm, and upon the subsequent transformation of this know-how into products or services for a market” (Klofsten, 1992, p 16).

In my opinion, this definition also implies the aspect of development.¹⁰

2.4.1 TBV characteristics

TBVs are associated with a range of characteristics that distinguish them from new ventures in general. However, it must be made clear that TBVs as a group, are not uniform (Heydebreck et al., 2000). This is something, which is important both to understand and to take into consideration, not least when discussing support measures. Despite this statement of variety, several characteristics unite the TBVs and make them special compared to other firms. First of all, they differ not only from large firms, but also from small firms in general (Storey & Tether, 1998b, 1998a). This difference between large and small firms may be a problem in itself, without the additional dimension of whether the venture is technology-based or not. This was shown by Penrose (1959) already in the end of the fifties, by Stinchcombe (1965) in the sixties and in the eighties, by Rothwell (1984). These authors propose a range of differences and competitive disadvantages for the small firm compared to larger firms.

The TBVs per se, when successful, offer high returns, but the road to obtaining these returns is said to be surrounded by high risks (Klofsten & Lindholm-Dahlstrand, 2000). According to Westhead and Storey (1997), the firms with the most sophisticated technology are those that have got the largest potential for getting high returns, but they are also associated with the highest risks. However, despite the fact that TBVs are considered to be risky, there is evidence that “tends to show that, on balance, technology-based firms are a lower risk” (Storey & Tether, 1998a, p 936). These, as compared with other start-ups, show faster growth rates (Storey & Tether, 1998a), although

¹⁰ There are ventures, both within the studied financial support system and within several of the incubators, which cannot be defined either as high technology or as ‘rocket science’. Nor are all of them originated by engineers. However, most of them according to the stated requirements of both novelty and innovativeness and the requirement of being able to commercialise can still be considered as being involved with new and innovative products or services, in terms of new to the market or in some cases, new to the world. Furthermore, other research uses stricter definitions, in which new technology-based is a synonym to research-based. Hence, it must be stressed that the choice of definition for this thesis may entail that what are regarded as specific characteristics and obstacles for the technology-based ventures addressed in some of the referred sources, to a lesser extent hold for all of the ventures studied in this thesis.

the authors do admit that the growth with regard to employment opportunities amongst the youngest firms is modest.

The list below describes some additional distinguishing factors that are commonly referred to as being of particular significance for TBVs.

- Well educated owners/founders (*Westhead & Storey, 1997; Storey & Tether, 1998b; Oakey, 2003*)
- Owners/founders lack of marketing abilities and/or managerial skills (*Jones-Evans, 1997; Westhead & Storey, 1997; Storey & Tether, 1998b, 1998a; Lindström & Olofsson, 2001; Mason & Harrison, 2001; Oakey, 2003; Tucker & Lean, 2003*)
- Technology focused and associated with advanced technology (*Jones-Evans, 1997; Westhead & Storey, 1997; Storey & Tether, 1998b; Lindholm-Dahlstrand & Cetindamar, 2000; Lindström & Olofsson, 2001; Oakey, 2003*)
- Concentration on one product (*Rothwell, 1984; Oakey, 2003*)
- Act on new markets, which are hard to access (*Lindström & Olofsson, 2001; Oakey, 2003*)
- Limited internal resources (*North et al., 2001*)
- Intangible assets and complex products (*Lindholm-Dahlstrand & Cetindamar, 2000*)
- Difficulties to influence or shape their external environment compared to larger firms (*Storey, 1994; North et al., 2001*)
- Associated with great uncertainty/risk, since they are concerned with new products/services, which implies double uncertainty if their case comprises both a new product/service and a new market (*Westhead & Storey, 1997; Lindström & Olofsson, 2001; Oakey, 2003; Tucker & Lean, 2003*)
- Advanced technology is difficult to evaluate (*Storey & Tether, 1998b; Lindholm-Dahlstrand & Cetindamar, 2000*)
- Affected by “liability of newness” which includes lack of legitimacy or credibility (*Stinchcombe, 1965*) See also note 46. (*Birley & Norburn, 1985; Van de Ven, 1993; Storey & Tether, 1998a; Klofsten & Lindholm-Dahlstrand, 2000; Zimmerman & Zeitz, 2002*)
- Recognized to have short windows of opportunity (*Westhead & Storey, 1997; Storey & Tether, 1998b*)

2.4.2 TBVs and their financing

“New, small, and unknown firms do not have the same facilities for raising capital as do established, large and known firms” (Penrose, 1959, p 37).

The problem of finding finance is often mentioned as an obstacle by individuals that have got an innovative idea that they are willing to realize within a new venture (cf. Westhead & Storey, 1997). It is also reported that entrepreneurs feel that their presumptive growth is constrained by lack of external financing (Storey & Tether, 1998a). Launching a new product or service onto the market is risky and costly (Westhead & Storey, 1997; Lindholm-Dahlstrand & Cetindamar, 2000; Oakey, 2003) and it often takes a long time before any returns on the investments are seen (Drucker, 1985; Storey & Tether, 1998b; Lindström & Olofsson, 2001; Oakey, 2003). The list of characteristics above explains why TBVs are considered as being “special” and as more risky than new ventures in general. Their characteristics increase their risk of encountering financial obstacles.

In studying the venture capital literature, it is easy to get the impression that the lack of capital is most severe during the expansion phases of the venture (cf. Harding, 2000; North et al., 2001; McGlue, 2002). Klofsten and Lindholm-Dahlstrand (2000) mention two occasions where the need for capital is crucial; during the start-up phase and during the latter expansion phase. Furthermore, Klofsten (1999) underlines that small amounts of capital given to the very earliest stages are of high importance. Ventures are often self-financed in the beginning (Klofsten & Lindholm-Dahlstrand, 2000; Lindholm-Dahlstrand, 2004), but from the research of North et al. (2001) we know that their assets are limited. Thus, before there is a market success, there have often been several rounds of external financing (Klofsten & Lindholm-Dahlstrand, 2000). The question is what happens if the venture is not able to obtain the funding that they need to make it to the market.

When studying the finance of early stages ventures, the demand for and supply of resources often prove to be unbalanced. This obstacle is hardly something new and it is often referred to as a financial gap or a funding gap. The debate over these gap-issues has been ongoing since the early thirties, when the Macmillan report (1931) was presented to the English parliament. These gaps can occur in different forms and stages. Mason and Harrison (2003), and Cressy (2002) suggest that a funding gap can be defined, either as a disequilibrium between the demand for and supply of loans (funds) or as a market failure. Harding (2002) states that there is a funding gap for high growth businesses. In her view, the gap is synonymous with the inefficiency in the market and an imbalance between demand and supply for finance on certain levels. “The concept of a funding gap is by no means straightforward” (Cressy, 2002, p F1) and most researchers today refer to these gaps as different kinds of market failures (Storey, 1994; Storey & Tether, 1998a;

Martin & Scott, 2000; Carpenter & Petersen, 2002; Harding, 2002; Lerner, 2002). The term “market failure” has been defined by Bator (1958) as ...

“... the failure of a more or less idealized system of price-market institutions to sustain "desirable" activities or to estop "undesirable" activities” (Bator, 1958, p. 351)

Bator describes “activities” as comprising production as well as consumption. Thus, market failure implies a situation of non-efficient allocation.

It seems that most of the research contributions on this issue concern equity based venture capital investments (North et al., 2001; Harding, 2002; McGlue, 2002; Salmenkaita & Salo, 2002; Mason & Harrison, 2003). Irrespective of what term is used, financial gap or market failure, the phenomenon is a barrier that from time to time is, or will be, faced by TBVs. Difficulties in getting the idea funded is one of the most common reasons as to why ventures fail. This obstacle is especially common for innovative ventures, since innovation is known to take time (Penrose, 1959; Drucker, 1985; Storey & Tether, 1998a; Lundström & Stevenson, 2002; Oakey, 2003).

Information asymmetries between investors and entrepreneurs is one of the most frequently given explanations as to why ventures fail in obtaining financing (i.e. for market failure) (Akerlof, 1970; Rothschild & Stiglitz, 1976; Berggren, Olofsson, & Silver, 2000; Carpenter & Petersen, 2002; Cressy, 2002; de Meza, 2002; Lerner, 2002; Shane & Cable, 2002). The concept of “information asymmetry” is explained by Shane and Cable as being an obstacle that emerges when two parties, in this case the entrepreneur and the investor, have different knowledge or information about each other’s conditions and potentials.

There are several reasons that explain why information asymmetry occurs. For example, the entrepreneur might be reluctant to reveal too many details since he/she fears that this might be damaging to the venture or benefit the competitors. From the investors’ point of view, the entrepreneur can, on the other hand, be regarded as being over-optimistic about the idea, since the investor is not aware of its full potential (Shane & Cable, 2002). Another explanation to the entrepreneur’s over-optimism might be that he or she lacks knowledge of all the factors that imply costs that have to be covered. The phenomenon of entrepreneurs being over-optimistic is also recognized by Åstebro (2003) and de Meza (2002). It seems that the investors in fact have reasons to be sceptical about too optimistic stories from burning entrepreneurs. As an example, it could be mentioned that 50% of the inventors working with inventions that were judged to be of low quality, continued their struggle, although that they were recommended not to (Åstebro, 2003). Furthermore, Åstebro (2003) shows that “the average probability that an independent inventor succeeds in commercialising his/her invention is estimated to about 0.07” (p. 227) compared to 0.27 for R&D in established firms.

To select prospective winners is not an easy task, even for those who are skilled. Lerner (2002) shows that despite careful selection and due-diligence procedures, the most common result of invested venture funding is failure, or in the best cases, survival with low returns. He along with researchers as Zacharakis and Meyer (2000), also shows that the return on venture capital investments originates from a low number of success cases. According to Åstebro (2003), neither society, nor the entrepreneur, benefit from too much optimism if this leads to pursuing inventions and ideas that lack quality. Finally, as shown above, it is emphasized that high technology as such is difficult to evaluate. Uncertainty about the potential of the idea, caused by asymmetric information, may affect the decisions of the investors, which might in turn lead to adverse selection (Akerlof, 1970; Rothschild & Stiglitz, 1976; Deakins, 1994; Carpenter & Petersen, 2002). Due to such evaluation problems, investors tend to invest close to the market launch, where the venture has gained proof of concept for its business idea (Mason & Harrison, 1997; Wessner, 2005). Early phases are therefore left unfunded (Oakey, 2003). However, although information asymmetry seems to be a major problem, Shane and Cable (2002) conclude that the two sides often seem to find ways to overcome, at least partly, this kind of obstacle.

Mason and Harrison (2002) argue that, from an investor's perspective there are complaining about the lack of high quality investment cases. The same authors (Mason & Harrison, 2001) state that the demand side also contributes to the equity-gap of the early growth stages. This is because the barriers for investments lie in a lack of proper investment opportunities and problems in negotiating with the entrepreneurs (Mason & Harrison, 2002; 2004). Mason and Harrison therefore suggest that entrepreneurs should be trained in understanding the advantage of taking on external equity based capital and emphasize the importance of TBVs getting "investment ready" before presenting their prospects to the investors. The concept of investment readiness incorporates three dimensions: (1) the entrepreneur's attitude to equity-based finance, (2) the entrepreneur's way of presenting the offer, both through written documentation, such as business plans and through oral presentation, and (3) the match between the entrepreneur's offer and the requirements of the investor. "...at its heart, becoming 'investment ready' is therefore about business development" (Mason & Harrison, 2001, p 664). Mason and Harrison also emphasize the "need to reach entrepreneurs at an early stage to enable them to incorporate equity funding in their planning process" (2001, p 666).

Finally, it is claimed that some entrepreneurs are averse to external ownership and carefully guard their independence, which prevents them from taking on external venture capital (Cressy & Olofsson, 1997; Berggren et al., 2000; Lindström & Olofsson, 2001; North et al., 2001; Harding, 2002).

According to Lindholm-Dahlstrand and Cetindamar (2000) early stage financing requires lower investments than do the latter stages. However, small investments are not unproblematic (Mason & Harrison, 2002; 2003). One major problem is that the costs for the evaluation of the cases are high, in

proportion to the sum invested (Harding, 2002, see also paper 5). This makes small investments more expensive than large ones, and hence implies that investors tend to stake for the larger investments. Investors are also accused of making short term investments without long term commitment (Oakey, 2003), which is in contradiction to how innovation develop (Drucker, 1985). Another obstacle that is pointed out is that high-technology has limited collateral value (Carpenter & Petersen, 2002).

2.4.3 The scope of public support programmes for TBVs

TBVs are targeted, fully or partly, by at least three policy areas; entrepreneurship policy, SME policy and innovation policy. These policy areas are described above. For the type of support studied in this thesis, entrepreneurship policy is probably the label that fits the best, since it covers the area of early stage firm development in which the TBVs is to be found (see Figure 2). However, before being satisfied with this choice of label, the scope of public TBV support programmes per se, must be clarified.

Above, I have shown that the area of entrepreneurship policy is broad and multi-facetted and is related to other policy areas. The policy areas where the connections are the largest are the areas of SME policy and innovation policy¹¹. According to Lundström et al. (2005; 2007; 2008) entrepreneurship policy and SME policy overlap from the time of firm-start-up to 42 months after firm-start-up.

If I begin with the scope of entrepreneurship policy, I would agree with the argumentation of Lundström et al. that the entrepreneurship policy area comprises the earliest stages of firm development and that it starts with bringing awareness. However, for two reasons, I find their division into phases, based on time, rigid (see e.g. the figure in Lundström & Svensson, 2005, p. 55). First, I consider registering a firm more as an administrative act than an entrepreneurial one. The start-up phase may of course include firm registration, but I regard the start of the action in it self as more important than the date of the registration of the firm. Second, the limit of 42 months¹² is problematic, since firms can remain immature although they have been registered for years (cf. Klofsten, 1992). Additionally, innovation takes time; and this holds especially for radical high-technology innovations (Drucker, 1985). This is also shown by the findings of paper 7. Among the third of the firms that were categorised as successful after five years, only a couple have attained, or are close to attaining a business platform. Therefore, and especially when studying TBVs, instead of a time-based limitation, I prefer to restrict my concept of early stage as being based on maturity (see section

¹¹ As shown by the Figure 2, the areas of science and technology policies, which are related to innovation policy (cf. Lundström et al., 2008), are not treated separately

¹² The Global Entrepreneurship Monitor (GEM), which is an international project for studies into entrepreneurship, according to Stevenson and Lundström (2007) uses the limit of 42 months, and they refer to this as their reason for adopting the 42 months border. The GEM studies involve large sets of data, hence they exemplify a case where time based limits are used due to practical reasons.

2.4).¹³ Finally, I am fully aware that the use of a time-based limitation is sometimes inevitable, due to practical reasons (e.g. when large sets of data are quantitatively analysed). However, it is my opinion that it is unsuitable in a generic context.

To conclude, the scope of entrepreneurship policy starts by creating entrepreneurial awareness. However, unlike Lundström and Stevenson (2005; 2007), I suggest that the scope of entrepreneurship policy ends when firms reach a stage of sustainability, i.e. when they attain a business platform (see Figure 2). Instead of the detailed sub-stage division suggested by e.g. Lundström & Stevansson (2005), I prefer to distinguish between ventures with ideas that have been commercialised and those that have not. This is because the (business) idea develops during the early stage. When actions start, the idea resides in a pre-commercialisation stage. In this stage, the idea is too immature to be launched onto the market (Klofsten, 2005). However, on its way to reaching a business platform, the idea develops and gains customers acceptance, i.e. it is launched on the market, and has thus entered a commercialisation stage, which is an important step in reaching a business platform (Klofsten, 2005). Hence, support programmes that target TBVs ought to facilitate this development process, i.e. by the use of different measures that help the ventures out of the immature stages.

Regarded this way, the overlap between the two policy areas could be illustrated as in Figure 2 below. The early stage is hence the stage where actions are taken, firms are registered and during which the idea changes form being in a pre-commercialisation stage to a commercialisation stage and finally attains a business platform. The vertical arrow of the figure shows that the maturity of the venture increases along with its development. The horizontal arrow shows that the degree of innovativeness among the firms increases moving right along the ellipses. This implies that new ventures in general, such as newly started Coffee shops and barbers, belong to the left side, and R&D-based spinoff ventures to the right side of the figure.

Lundström et al. (2008) distinguish between entrepreneurship policy and innovation policy. According to them, the scope of innovation policy starts in what they have labelled as a pre-start period (i.e. before firm-start-up) and continues beyond their 42 months limit to also comprise, what they have labelled the maintenance and expansion period. As discussed above, they argue that although the expected outcome of these two policy types is similar, their goals differ, i.e. innovation policy focus on productivity- and technology improvement rather than job- and firm creation, which are the main goals of entrepreneurship policy. Additionally, Bergek, Jacobsson, Hekkert, & Smith (2008) advocate a systemic view of considering (technology) innovation. This

¹³ It can be complicated to measure maturity. However, this ought to be regarded as a challenge rather than a deterrent. The study by Davidsson and Klofsten (2003) and paper 7 show that there are ways to solve this problem. Furthermore, the measure "commercialisation incidence" that is used in paper 5, could be one way to determine whether the borderline between pre-commercialisation and commercialisation has been passed. This measure is easy to compute (if accounting data is available).

implies that, in the case of technology innovation, the firm level is not regarded as relevant in the same way as it is for entrepreneurship- and SME policies. As I have stressed above, innovation policy “cuts the cake” in a different way than does entrepreneurship- and SME policy. Because of this, I have placed innovation policy at the right side of the other two types in Figure 2. However, as shown by the figure there is an area of overlap, which I consider as “home” for support programmes that focus particularly on the innovative TBVs in particular e.g. spinoff-ventures from the research of universities, institutes and private corporations.

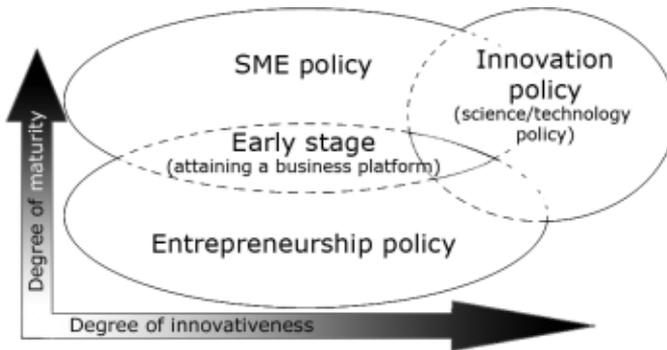


Figure 2, The scope of policies for facilitation of early stage technology based ventures

2.5 Rationales for- and use of public support

“Governments in the advanced market economies, during the past decade, increasingly have promulgated measures designed to assist small manufacturing firms. This is based on a belief in their ability to produce innovations, their employment creating potential and their potential for regional regeneration; and indeed there exist strong evidence to suggest that small firms have a significant role to play in all three areas” (Rothwell, 1984, p.160)

One issue that it is important to consider is why taxpayers’ money should be spent on private ventures – i.e. the rationale for public support policies. The literature concerning this issue is quite extensive, and different types of rationales are put forward. Before listing these rationales, it must be underlined that several studies argue that strong reasons are needed to motivate governmental intervention in private venturing (Vedin, 1993; Audretsch, 2002). According to Storey (2003), government intervention is justified only as a complement to the market, i.e. to cover situations where the market fails.

To organise the rationales, I have divided them into two categories, i.e. those based on societal desires and those based on identified or assumed barriers. For the first category, “desires”, it can be concluded that

entrepreneurship and innovation (or rather the actions and artefacts that they represent) in general, together or separated, are regarded as engines of growth and wealth (cf. North et al., 2001; Audretsch, 2002, 2004; Audretsch, Grilo, & Thurik, 2007; Stevenson & Lundström, 2007), and as tools to increase productivity (Lundström et al., 2008). Entrepreneurship and innovation are also regarded as a source of job creation (or to reduce un-employment) (cf. Audretsch et al., 2007; Stevenson & Lundström, 2007). The concepts imply the commercialising of inventions and new ideas (cf. Baumol, 1996; Audretsch, 2004), and finally, they are an option for those that do not fit the role of mainstream employees (cf. Stevenson & Lundström, 2007).

TBVs are manifestations of innovation and entrepreneurship and it is claimed that “rapid and sustained growth cannot get along without them” (Baumol, 1996, p. 184). It is recognised that TBVs create jobs, commercialise new technologies and products, and create knowledge/technology spill-over or transfer (cf. Rothwell, 1984; Autio & Yli-Renko, 1998; Storey & Tether, 1998a; Almus & Nerlinger, 1999; Audretsch, 2002; Tucker & Lean, 2003; Stevenson & Lundström, 2007; Wessner, 2007). If successful, they may also be important as role models for aspiring entrepreneurs (Autio & Yli-Renko, 1998).

The second category of rationales, the “barriers” represents factors regarded as obstacles or disadvantages, and which can therefore be seen as providing motivation, in case of policy intervention. These are often coupled to the characteristics of the TBVs. Market failure is, in fact, one of the most frequently proposed reasons for rationalising policy interventions (cf. Storey, 1994; Audretsch, 2002; Salmenkaita & Salo, 2002; Audretsch, 2004; Stevenson & Lundström, 2007). According to Audretsch (2002) and Audretsch et al. (2007) there are three types of externalities caused by market failure that can provide reason for public intervention; network externalities, knowledge externalities and learning externalities. Additionally, the use of public intervention can be motivated by structural rigidity (Salmenkaita & Salo, 2002) and systemic failure (Salmenkaita & Salo, 2002; Stevenson & Lundström, 2007).

Maigart and Struyf (1997) argue for governmental support of high technology start-ups, and stress that subsidies and R&D funding play an important role. They also noted that entrepreneurs lack awareness of the opportunities for publicly funded finance. According to Martin and Scott (2000), “strict reliance on a market system will result in underinvestment in innovation, relative to the socially desired level” (p 438). This is because, in some cases, innovation can be generic in the sense that an innovation can be used in many industries. Under such circumstances, there is a role for public support, e.g. that funding for SMEs as well as for start-ups can prevent R&D investments from suffering. Lerner (2002) argues that public financial support activities facilitate technological spill-over.

Taken together, the factors referred to above explain why increasing entrepreneurship and innovation is a societal interest. One way to see to this interest is by the facilitation of TBVs, for example through, various public support programmes. Besides the above listed reasons for why policy

interventions may be needed, there are suggestions as to the form that the involvement should take to be as efficient as possible.

Lundström and Stevenson (2002; 2005; 2007) give a number of suggestions on how policy interventions to support entrepreneurship could be provided. These range from measures to create entrepreneurial awareness to measures to support the early stage development processes. They also emphasise the importance of customising the policy interventions to the national/regional context in which they will be implemented (Stevenson & Lundström, 2007). Story (2003) also argues that it is problematic that individuals do not realise the benefits of starting a business. He suggests, in line with Lundström and Stevenson above, that this could be solved by measures to increase awareness of the advantages of entrepreneurship. North et al. (2001) distinguish between the expressed needs and latent needs of the firm. They suggest that it is better that the available public resources are put into “the needs of the economy” (p 305), rather than into the expressed needs of the entrepreneur. They prefer a strategic innovation policy rather than meeting individual needs.

Another problem is that financial institutions cannot assess early stages ventures, mainly due to information asymmetry (Storey, 2003). This implies a risk of lack of finance for small firms, hence to cover such gaps may be a public funding may be justified. Furthermore, it is shown that private investors also tend to avoid the earliest stages and instead, invest in stages where they can see good prospects of getting a return on their investments (Bygrave & Timmons, 1992; Wessner, 2007). This implies that the early stages ventures are left unfunded (Oakey, 2003; Storey, 2003). Carpenter and Petersen argue that “if financing constraints are widespread in the high-tech sector they could potentially inhibit economic growth” (2002, p F55). Wessner (2005; 2007) labels this early stage funding gap as “the valley of death” for TBVs.

The funding problems might be remedied by public support, as a number of studies show that public support for early stages decreases the risks connected to later stage investments (Klofsten et al., 1999; Lindholm-Dahlstrand & Cetindamar, 2000; Lawton, 2002; Lindholm-Dahlstrand & Klofsten, 2002; Oakey, 2003). This is because the support given can increase the credibility of the venture that has received the support (cf. Klofsten et al., 1999). Cooperation between public and private capital is therefore suggested (Lindholm-Dahlstrand & Cetindamar, 2000; North et al., 2001; Harding, 2002; Oakey, 2003; de Neergaard, 2004; Wessner, 2005).

Mason and Harrisson (2001) argue that the problem of obtaining finance is also found on the demand side, and propose ventures’ lack of investment readiness as an explanation as to why financial gaps arise. If this argument holds, working with attitudes amongst the entrepreneurs is, as they suggest, of great importance. North et al. (2001) argue along the same direction and state that “one of the tasks of innovation support should be to encourage attitudinal change on the part of owner-managers with respect to external finance” (p 309).

Conversely, several researches are more or less sceptical to the public support of new ventures. Bergström (2000) argues that subsidies may cause technical inefficiencies, and whether these are good or bad for long-term growth can be questioned. Bergström has surveyed selective subsidies, e.g. regional policy subsidies towards the northern parts of Sweden. His findings suggest that subsidies are positively correlated to growth during the first year, but that afterwards, the correlation decreases. He therefore argues that being subsidised can make firms less efficient, since there is a risk that the subsidies are allocated to less productive firms which implies that these firms only survive a little bit longer than they would have done otherwise. Åstebro (2003) and Parker (2007) warn in a similar vein. Åstebro argues that both society and the individual ventures are better off if low-quality ideas are stopped at an early stage. Additionally, Parker (2007) warns for the risk that public initiatives may crowd out private ones, and argues that in such cases “the ‘cure’ might be worse than the ‘disease’”.

Svensson (2007) shows that firms that have financed their IPR protection with public money, tend to be less successful in commercialising their inventions than those funded by private actors such as VC. He explains this lack of success as depending on the lack of ability of government-employed administrators to select the cases with the best prospects. Storey (1994) claims that “...as a whole, public sector financial intervention to support small firms cannot be viewed as successful” (p 231). Cressy and Olofsson (1997) are also sceptical to government finance. They claim that equity gaps originate from constraints on both the demand- and the supply side. To them “a governmental policy of simply throwing money at the problem” (Cressy & Olofsson, 1997, p 192) like public schemes, especially those aiming at small firms, which offer easy money but no hands on advice, will not solve the problem. In addition, Lindholm-Dahlstrand and Cetindamar (2000) also emphasize the importance of what they call “competent capital” (capital in combination with advice).

2.6 Policy theory – goal for action rather than science

Concepts such as “policy theory”, “programme theory” or “programme logic” are sometimes mentioned when policy initiatives are discussed. These terms can be regarded, more or less, as synonymous. According to Hoogerwerf (1990), the concept “policy theory is defined as the total of causal and other assumptions underlying a policy” (p. 285). Hence, this concept does not represent research-based theory, but rather the intentions upon which a policy or a programme is funded. Hjalmarsson (1998) suggests that programme theory can be regarded from different theoretical perspectives and that the choice of perspective affects the goals on which a programme is founded. Furthermore, it is shown that policy programmes that are based upon incorrect assumptions often fail (Hoogerwerf, 1990). It is also shown that if a programme lacks a clearly stated policy/programme theory, the follow up and evaluation of its outputs and effects becomes complicated (Vedung, 1998; Storey, 2000; Hjalmarsson & Johansson, 2003). Programme theory is just not coupled to the goals and assumptions of a programme. Instead, it can be

regarded as the essence of the programme, i.e. something that has to imbue the whole programme from its goals through its support actions and to the outcome – it is the alignment of the programme.

As far as policy programmes are concerned, the issue of clearly specified goals and targets has been stressed more than once. “When the goals of a policy are unclear, diffuse or diverse, as they frequently are, determining the extent to which they have been attained becomes a difficult and frustrating task” (Anderson, 2003, p. 260). In an OECD paper, Storey argues that “evaluation cannot take place adequately until the objectives and targets of SME policy are clearly specified” (2004, p. 5). In another paper, he (Storey, 2000) argues that “a characteristic of governments in all developed countries seems to be, at best, being opaque about the objectives of small business policy” (p. 177). Storey therefore demands increased clarity and coherence in policy goals as well as in the lower level targets. Storey (2004, 2000) expresses disappointment over the fact that the academic community has showed little interest in the area of public policy development. He argues furthermore that evaluation must be part of the policy programme. As an example, he claims that it is important to assess the nature of the market failure which the programme is designed to solve before the programme is implemented (Greene & Storey, 2007). The same authors also recommend evaluations during the programme in order to be able to tune and improve the programme.

2.7 The national context of support to TBVs and the present Swedish situation

2.7.1 National support actors

In Sweden, several publicly funded actors provide support to TBVs. To give an overview of the context, the main actors that support TBVs are illustrated below (Figure 3). Besides these actors, there are regional initiatives, although most of them obtain their funding either from the actors listed below or from other regional actors such as municipalities and province administrations.

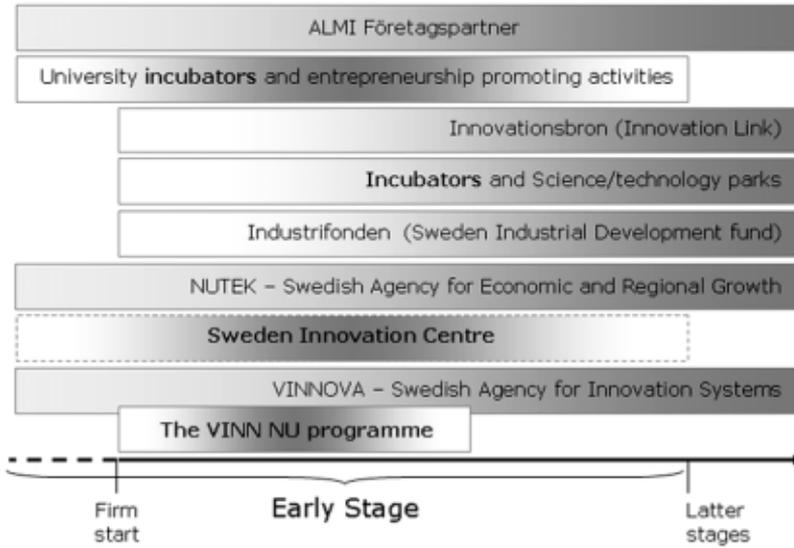


Figure 3, Some publicly funded support actors in Sweden

The illustration is arranged as follows: The bottom row indicates the stage of venture development. As several actors go beyond the earliest stages of development and also support mature firms, such as small and medium sized firms (SMEs¹⁴) the illustration continues to the right direction beyond the limits of the picture. The support actors are displayed in alphabetical order and their focus with regard to the stage of the firm is indicated by the intensity of the grey colour of the bar. Each actor is briefly described in the following text. The information is based upon their own descriptions that are displayed on their respective websites.¹⁵ Bold characters indicate that the actor is part of the empirics for this thesis.

The Almi Företagspartner AB is a company group that was established in 1994. It is represented through regional offices (daughter-companies) in all the 21 provinces of Sweden. Almi supplies new and established firms with finance, mostly in the form of different types of loans, and also with advice. They also arrange seminars, events and network activities. Almi inherited the SIC-programme when it was wound up in 2003.

Both universities and science/technology parks are actors that work to promote entrepreneurship. One way in which they do this is by running incubators. The incubators are part of this study and are therefore described below.

¹⁴ SME firms ranges from 1-250 employees (500 in the USA).

¹⁵ Almi: www.Almi.se, Incubators: see Swedish incubators and science parks – SISP, www.sisp.se, Industrifonden: www.industrifonden.se, Innovationsbron; www.innovationsbron.se, Nutek: www.nutek.se, SIC: no website since the scheme has been winded up. Vinnova: www.Vinnova.se

Industrifonden¹⁶ was initiated in 1979, and is a publicly owned and financed venture capital fund that offers growth capital for small and medium sized Swedish companies in most sectors. Their investments consist of both loans and equity capital in the range of k€¹⁷ 225 and M€ 5.5, and typical investments are of approximately M€ 1.1. The fund is co-owner of a number of regional private venture capital companies (SVCA, 2005).

The next actor, Innovationsbron¹⁸ was initiated in 2004 as a further development of the actor Teknikbrotiftelsen. Its focus today is on helping to commercialise business ideas and innovations. This is done by financing incubators and in cooperation with other regional support actors, such as venture capital funds and Almi.

Nutek is a governmental agency that is part of the Ministry of Trade and Industry. Its inception was in 1991 through a merging of three previous agencies. The aim of Nutek is to strengthen Swedish trade and industry at a national and regional level by aiding the creation and growth of Swedish firms. Product development has been the focus of several of the dedicated programmes, both previous as well as current. Sweden innovation centre (SIC) is part of the study and described below. Finally, Vinnova is an other governmental agency that sorts under the governmental ministry of trade and industry. It sprung from the Nutek departments for R&D finance and innovation systems in 2001. The focus area is innovation, concerning products, services and processes and coupled to research and development. Vinnova has several policy programmes with different aims and target groups. The Vinn Nu programme, that is part of this study, was started in 2002 as Vinnova's first programme.

2.7.2 The current Swedish situation

At a national level, the issue of public venture support has been matter of discussion. According to Swedish reports, such as those by de Neergaard (2004) and Larsson (2006), there is a shortage of seed finance in Sweden. However, the solutions that are suggested for solving this question differ as do the priorities of groups that are targeted by the interventions. De Neergaard (2004) argues that the old system of support was fragmented and that a greater holism is needed. In line with the writers of other policy documents (such as Ds, 2004:36; Regeringskansliet, 2006) de Neergaard claims that R&D is one of the most important sources for the generation of presumptive growth firms. Larsson (2006), on the other hand, put his focus on the individual inventors and their needs.

The present Swedish financial support dedicated to new venture ideas is today limited to funding from Almi, Nutek, Vinnova and the Innovationsbron, as described above. Most of this funding is available as different kinds of loans

¹⁶ No translation available for Industrifonden

¹⁷ 1€ = 9.197 SEK (5 year mean 2002-06-30 - - 2007-07-01, Bank of Sweden)

¹⁸ No translation available for Innovationsbron. Teknikbrotiftelsen was translated as the Technology Link Foundation.

or against equity shares. For new ventures, there are some possibilities to get smaller sums in the form of subsidies, but regional policies and solutions differ. It is also worth noting that current financial support, with the exception of the Vinnova programmes Vinn Nu and Vinn Verifiering, is not exclusively directed towards the earliest phases. Almi, for example, supports also SME firms. Additionally, it has to be noted that the Vinnova programmes are focused on research-based (or at least knowledge-based) ventures. With regard to public support for emerging ventures provided on a broad basis, Almi can be singled out as the only actor available (Edling et al., 2007)¹⁹.

Besides public sources of funding, external capital can be obtained from private sources, such as equity-based venture capital. However, the development of the Swedish investments directed towards early phases is rather weak. During the first part of this decade, the investments dedicated to seed and start-up phases decreased annually (SVCA, 2000, 2002, 2003). During more recent years, investments in total have increased, although the relative share for the earliest phases is still decreasing (SVCA, 2005, 2007). For 2004, just over 1800 M€ was invested by the VC firms, of this 1% was dedicated to seed phases, and 7% to start-up phases (SVCA, 2005). For 2005, total investment increased to 4400 M€, although the relative figures decreased, as 0.3% of the total was provided to seed phases and 4% to start-up phases (SVCA, 2007). The relative amount dedicated to early phases is reported to be decreasing in Europe as a whole. For 2005, only 0.2 % of the total VC investments were in seed phases and 5% in start-up phases (EVCA, 2006).

From the above, it can be concluded that the opportunities to find external finance are limited. The concentration of early stage support to one main actor (Almi) might be part of the creation of a new Swedish system for venture support which was demanded by de Neergard (2004). However, other actors still regard the situation as being problematic, not at least concerning the support for individual inventors (Larsson, 2006). With regard to process-oriented support, Almi is a main actor. In addition, universities and incubators also supply training programmes, advice, coaching activities and network mediation. To conclude, the Swedish support system is still developing.

2.8 Summary of the frame of reference

This chapter started by explaining the concepts of entrepreneurship and innovation. In this thesis, these concepts are treated as synonymous, i.e. both concepts are about the attempts to carry (business) ideas into practice. The reason why I have treated them as synonyms is that they are manifested by the same individual(s), especially in the early stages of venture development.

¹⁹ There are also some regional funding available (e.g. through the province administrations and some regional funds), especially if the venture is able to claim that it is situated at the countryside in a less dense region that can invoke regional support from the EU. However, I regard this as being of marginal impact.

As firms cannot develop in the vacuum of an institutional environment, they are a part of a larger context. In order to describe the context that surrounds both the studied ventures and the organisations that support them, an innovation system view is used. According to this view, ventures, firms, customers, financiers and other organisations, as well private as public ones, are the actors of the game. Institutions (i.e. laws, regulations and common sense) rule the actions and interactions between the actors within the system. This implies that the IS is regarded as being the external resource base that is required for the development of the studied ventures.

The policy to support early stages ventures is labelled entrepreneurship policy. This type of policy is broader, in terms of its focus, than SME- or innovation policies, for example. Applying an innovation system approach shows that different policies are connected to different types of innovation systems, e.g. entrepreneurship policies are in the main linked to geographical IS and innovation/technology policies in the main are linked to technology/sectoral IS.

Policy measures, within the area of entrepreneurship policy aimed at TBVs, are rationalised by two types of rationales, i.e. societal desires and barriers, with which the ventures supported are associated. This is because TBVs manifest factors, such as growth and innovativeness, which is desired by policymakers. TBVs are also associated with certain barriers that imply a need for support, e.g. the risk of meeting different aspects of market failure.

The programme theory is the goal of action of a policy programme, and in order to facilitate evaluation there must be coherence between the actions undertaken and the expected outcome. This requires specified and measurable goals.

Finally, this chapter has given an overview of the main, current Swedish support actors. It also describes the national situation today. This shows that although the sums of money directed to early stages ventures in terms of venture capital investments has increased over recent years, the relative share has decreased. Furthermore, most public support initiatives are geared to ventures that derive from R&D, i.e. university spinoffs and spinoffs from R&D within private corporations. It would seem that Almi is the only actor that supports the emergence of new ideas (i.e. inventions from other sources than above) in a broader sense.

3 Method and sample characteristics

This chapter is organised as follows; firstly, I will look retrospectively and explain why this area of research was chosen. This is followed by some reflections on my perspectives of science, research and objectivity. Secondly, I take up some thoughts coupled to the methods and research strategy for this thesis. Finally, the empirics, i.e. the objects studied and why they were chosen, will be dealt with.

3.1 Prologue (or why I ended up studying public support to TBVs)

Before starting to discuss the methodological issues of this thesis, I will briefly describe why I have chosen to focus on this area of research. In fact, this research journey started several years before my PhD studies, during my former work as part of the managerial team of Västerås Technology Park (VTP)²⁰. It was during these years (i.e. 1998-2003), that I became interested in TBVs and how their processes could be supported. To promote entrepreneurship, and to facilitate the emergence of new ventures in the park, VTP used an entrepreneurship training programme²¹, which was bought from Linköping University (i.e. from the Center for Innovation and Entrepreneurship, at the department for Project management, Innovation and Entrepreneurship, where I became a PhD candidate). Although venture incubation was not my main responsibility within the park, I became fascinated by how the ventures developed through this programme. The idea of doctoral studies had been on my mind since I gained my undergraduate exam in 1994, but through VTP, I finally found a subject challenging enough to make me take the step and become a PhD candidate.

Through my work at VTP, I got a dose of entrepreneurial experience myself, as the park, back in 1998, was nothing more than a start-up firm. All we had then were good ideas, a plan, some initial finance, an entrepreneurial manager and a good team. Furthermore, the growing network of park companies and other surrounding actors also joined us.²² This network was one of the park's most important resources, and its maintenance was my main responsibility. During my years at VTP, I really learned how to build, maintain and utilise a good network – a skill that also has benefited me as researcher. During my work at VTP, I also got some insights into the SIC support programme. This was because SIC had special activities geared towards the TBVs in Swedish incubators and science parks. Through this, I had the opportunity both to help ventures apply, and to observe part of the selection process from the inside.

²⁰ My former title was head of the growth park.

²¹ This entrepreneurship training programme was invented by my supervisor, Magnus Klofsten

²² 2003 when I left VTP there were 130 firms within this network.

I have taken this up here since I think that my work experience has affected me as researcher in a number of ways. For example it has led me into interesting topics of research (e.g. paper 1). It has given me practical insights into how to build an organization from the start and how to work with networks. It has also given me the opportunity to follow people, who have started firms, through their start-up processes. Additionally, I have earned practical insights into how support organisations, such as incubators and science parks, work. This has been useful when interacting with both entrepreneurs and representatives from other support organisations. I also think that it has broadened my understanding of the support programmes studied. Finally, I have learned how to anchor and finance projects, as in the park, we had to collect external money in order to run our projects. This latter has also been useful when we have applied for finance for my doctoral studies. All in all, it is my conviction that the combination of these practical experiences has made me a better researcher with a deeper understanding than I would have been without them.

3.2 Reflections on science and research strategy

3.2.1 A scientific work

A doctoral thesis is expected to be a “scientific work” – big and serious sounding words. The first question one has to ask then is what characterises such a work? To give a short and comprehensive answer is, as the great mass of literature produced in this area shows - difficult. I will therefore not try to be pretentious and dig too deeply into this question; however, I think that some shallow reflections might be of use. I do not strive to define concepts, but rather highlight some elements that to me stand out as important. To start with, it is my belief that the vast majority of researchers would at least not disagree with the proposition made by Gustavsson (2004), in which he characterises science as organised and systematically collected knowledge. This proposition therefore ought to hold also for the social sciences in which category this thesis belongs.

To be able to act in a scientific way presupposes at least three things; firstly, that the researcher has some kind of problem or task to collect knowledge about. Secondly, that there is some kind of reason for collecting this knowledge. Thirdly, that the way the knowledge is collected is based upon some kind of systematic strategy, and on some kind of conscious rules that can be described to others (Alvesson & Sköldbberg, 1994; Arbnor & Bjerke, 1994). The third point ensures transparency of the work and the possibility for other researchers to reproduce the knowledge.

An argument that has followed me during my academic studies, and which was particularly obvious from the latest review comments concerning one of the papers within this thesis, is that a piece of scientific work ought to both relate to and contribute to the accumulated base of knowledge for the field of research. This ought to imply that the researcher requires knowledge of firstly what constitutes the actual field of research, secondly, what is captured by

this field, and thirdly what parts of this field concern the particular and narrow topic of interest, i.e. the frame of reference for the topic studied. This implies that the researcher ought to have studied a significant amount of books and papers on the topic. Furthermore, scientific knowledge is commonly coupled to empirical observations in one or way another, which according to Arbnor and Bjerke (1994) implies that it “contains an explicit relation between ideas and empirical observations” (p 38). This implies that other dimensions are added, such as regarding ethical aspects of information collection, i.e. that the integrity of those leaving information must be respected. In my case, this has been solved by promises of anonymous treatment of respondents. I have also signed secrecy agreements to get hold of the data.

3.2.2 The view of the surrounding reality

Intimately coupled to the view of science and research, at least for the social sciences, is the way of regarding the surrounding reality. Reading Alvesson and Sköldbberg (1994) and Arbnor and Bjerke (1994) reveals two main traits: The first of these traits has its roots in natural sciences and positivism, and from this perspective, the reality is regarded as objective and measurable. Following this trait implies that one must strive to simplify, generalise and describe the reality by cause-effect correlations, logic models and through cases that are representative (can be generalised from or to) for a larger sample than the studied one (Arbnor & Bjerke, 1994). The second, the hermeneutic way of regarding science and research, takes a qualitative approach. It describes the reality more as being socially constructed. In this approach, the methods for measurement used in the natural sciences are replaced by methods which have developed in order to understand, interpret, visualise and liberate the subjective and complex reality (Arbnor & Bjerke, 1994).

To narrow things down a little more, Arbnor and Bjerke propose three methodological perspectives or views; the analytical, the system-based, and the actor-based. The first two approaches regard reality as objective and the third regards reality as being socially constructed. Arbnor and Bjerke (1994) argue that the different methodological approaches are seldom used downright, and the researcher is commonly influenced rather than ruled by them. However, they stress that it seems impossible to combine approaches that have very different values i.e. reality has either to be regarded as being objective or as socially constructed. Their recommendation is therefore that the researcher should choose one methodological approach, and make this one her or his basis.

Following the descriptions of Arbnor and Bjerke (1994) my scientific base seems to have most in common with what they have named the analytical approach. According to them, the analytical approach has its roots in the positivistic/ natural science tradition as it tries to explain reality in terms of models, categories and causal correlations. This approach is said to be the most common, also in social science, and its history is long. Its ambitions are to define a problem, and then to describe, explain, forecast, and finally be

normative. Generally, the ambition of the researcher using this approach is to determine factors and to measure impact – however, in the practical work, the aim is often shifted towards the investigation of factors and towards the estimation of their impact. This also holds for this research, as the complexity of the reality and the tasks investigated seldom or never allows for determination and exact measures.

According to Arbnor and Bjerke (1994), the analytical approach can be criticised for reducing the knowledge by categorising it into statistically treatable variables and by letting statistical techniques instead of the theory determine the data collection. Furthermore, it is accused of being fragmented, since the variables are taken out and analysed outside and independent of their context. This may imply that individuals as well as their context and dynamics are forgotten. However, with regard to the other approaches, it has been shown that none of them is free from either critique or problems.

3.2.3 The issue of objectivity

Objectivity is another important issue; can a researcher be truly objective? Alvesson and Sköldbberg (1994), Arbnor and Bjerke (1994) and Holme and Solvang (1991) all note in agreement with Gunnar Myrdal, that social sciences can never be either objective or neutral. The philosopher, Peirce, argued at the beginning of 1900 that experience, or practically based knowledge, is to be seen as an advantage (Peirce, 1990). In accordance with Peirce, it is important to start out with the state of mind, and with the knowledge that one possesses at the time, as it is impossible to get rid of this knowledge. He called his ideas pragmatism and advocated an abductive approach²³. Arbnor and Bjerke (1994) cite Steedman and argue that the knowledge cannot be separated from the researcher, which is in agreement with the ideas of Peirce referred to above. This argument is also stressed by Thurén (1992) who argues that the author, irrespective of attempting to be objective, always affects the work with his or her personality. The reason for this is that social scientists are exposed to a number of situations where they are forced to make choices of how to continue, and these choices are subjective.

To me this holds true irrespective of whether the method is quantitative or qualitative. Although that a statistical analysis might be regarded as being “objective”, there are several occasions where the researcher has to make interpretations and subjective considerations, for example when questionnaires are designed and formulated and when results are analysed and synthesised. A similar view is expressed by Ljung (1993), who argues that objectivity, in the meaning of being neutral and being able to conduct unbiased research, is neither possible or desirable in social science. However,

²³ This approach is described as a “conscious interaction between theory and practise that often takes its way via empery, methods and models” (Wigblad, 2003, p. 7). The abductive researcher then talks about “joining theory with practice, or to develop models and methods that couples theory and practice” (ibid). For a more thorough discussion of the theory of Peirce from my perspectives, see the method chapter in my licentiate thesis (Peirce, 1990; Norrman, 2005).

it is important that researchers are open-minded and base their statements on facts (Holme & Solvang, 1991; Ljung, 1993). Holme and Solvang (1991), as well as Arbnor and Bjerke (1994) refer to a number of bullet points formulated by Gunnar Myrdal, in which he emphasises the importance of researchers being explicit with their own values in cases where these values can be feared to affect research and that these values should be discussed in their reports.

3.2.4 Some reflections on the techniques and methods used

The methods and techniques used within this study are described in detail in each of the papers of which it comprises. I have based the choice of methods and techniques on the following factors:

- The research questions and in what way they can be answered.
- My view of science – the analytical perspective.
- The nature of the data – my data is primarily of a quantitative character

The research questions in the main have been drawn from my previous work and from the papers included. I regard this as a natural way to proceed, since I have chosen to write this thesis as a covering paper around a number of appended studies, and not as a monograph.

In my licentiate thesis (Norrman, 2005), two research questions were addressed, i.e. what ventures get public financial support and what problems are inherent in the evaluation and comparison of incubator performance evaluations. These research questions are coupled to my initial studies of SIC and to the earlier version of the incubator paper. The purpose of the licentiate thesis, from a research perspective, was to create a foundation for further research, i.e. this thesis. Because the research questions was of a “what” and “who” character, and since the character of the licentiate research questions was descriptive, archival analysis (i.e. quantitative analysis of programme specific data²⁴) was chosen (Yin, 1994). Although, on a general level, the research topic is almost the same now, as it was two and a half year ago, the scope of this thesis is broadened. To be able to follow the purpose stated in this thesis, to analyze the rationales, goals, design and outcomes of public programmes which aim to support TBVs, and to identify implications for research and practice, an ability, not only to describe, but also to explain is required. To meet this requirement, the method has been expanded to include a survey and qualitative analysis in the case of interviews (Flynn, Sakakibara, Schroeder, Kimberly, & Flynn, 1990; Yin, 1994). Furthermore, the theoretical frame of reference has been broadened. With regard to the second point, which concerns my view of science, it is my opinion that the choice of research strategy fits the analytical approach under which I have categorised my self²⁵.

To be frank, it is the third point, the nature of the data that has been the most decisive factor behind my choice of methods, as quantitative analysis is a

²⁴ I.e. the computerised diary of SIC

²⁵ The analytical perspective is my main perspective, however there is a minor expansion towards a systemic approach, i.e. the innovation system approach that is applied.

very convenient way to analyse large sets of quantitative data. I would probably have been able to reach comparable conclusions using other methods, such as qualitative interviews, but as will be explained below, my choice fell on quantitative methods as the main tool for data collection and analysis²⁶.

When I first started to look at SIC, it was suggested that I should take applications from the archives and read them one by one. However, on my first visit to the SIC office, I realized that the number of applications was quite large – almost 6000 applications for loans and some additional 1000 for scholarships. It was then that I realized that the computerised diary of SIC was convertible into a format compatible with SPSS (a software for statistical analysis).

Through the discovery of this computerised diary, I took my first step into quantitative analysis, which since that day has been my basic instrument of analysis. However, I have used different analytical approaches. For papers 2-4, programme specific data has been used to map, explore and describe the issues studied. Analysis has been conducted by the use of the software SPSS. For paper 5, the programme specific data has been supplemented with accounting data in order to detect the impact of the treatment. The methodological approach has been more sophisticated, since quasi control groups and analysis of matched cases has been undertaken. The analysis in case of paper 5 was performed by use of the statistical software STATA.

Paper 6 and 7 are based on questionnaires. The aim of paper 6 was to map the attitudes of ventures supported by the SIC programme, and the aim of paper 7 was to map the attitudes and the development of firms supported by the Vinn Nu programme. The quantitative analysis has been run in SPSS. On the last measurement occasion of the Vinn Nu firms (paper 7), half structured telephone interviews were added. These however have not been deeply analysed for this thesis.

Paper 1 is the only paper that not has been based upon quantitative analysis. Instead, it can be described as being conceptual, as it is founded upon literature studies and as its aim is to develop a theoretical framework for analysis. It must be emphasised however, that in principle all the papers have been complemented with qualitative elements in the form of interviews. The reason to this is to remedy the criticism referred to above, that quantitative analysis reduces and fragments the data. To ensure validity, the findings of the qualitative analysis have been discussed and verified with people with knowledge of the circumstances, such as former officials of SIC, representatives from the inventors associations and personnel of Vinnova. The details are given in the method sections in each of the respective papers. However, some issues can be discussed on a common level, and this will be done below, in section 3.2.5.

²⁶ The databases used are summarised in Table 2, page 47-48.

3.2.5 Quantitative analysis

As the main methods used can be described as quantitative, I will dedicate some lines to discussing quantitative analysis on a more general level than has been done in the papers. Quantitative analysis in general aims at establishing causality between investigated factors. However, it must be kept in mind that dependent variables are seldom influenced only by the independent variables, and instead it is more common that the correlation is manifested by a correlated variation between the investigated (i.e. the dependent) variable and the independent variable (Bryman & Cramer, 2005). Quantitative investigations, along with scientific work in general, are characterized by a systematic collection of data. Commonly, but not always, the work is initiated by some kind of hypotheses which are generated from the theory of the field investigated. Finally, the data collected is analysed and interpreted in order to gain knowledge (theory) – i.e. to generalise from the topic studied (Sverke, 2003b; Bryman & Cramer, 2005). According to Sverke (2003a) the approach should be chosen based on the context of the research. If new knowledge is to be generated and if the theory base is undeveloped, Sverke recommends an explorative approach. If the purpose is to increase the knowledge base of a field where there is already some theory, a descriptive approach might be more appropriate. In cases where the theory is well defined, it is more about verification, which implies approaches that aims to explain. For this research, I started by being explorative (i.e. I have based my analysis upon theoretical assumptions, but I have also investigated the data in a more open and explorative way) and have then moved towards explanation (i.e. the analysis based upon theoretical assumptions and previous findings).

Irrespective of the purpose and techniques used, following an analytical science approach implies striving for reliable and valid measures. Reliability is defined as the relative absence of random measurement errors, which implies that reliability increases when the number of errors decreases (Sverke, 2003b). Reliability can also be said to represent the extent to what a measurement procedure generates the same results on repeated measurement occasions, i.e. the reproducibility of the measurements. Reliability concerns random errors, but the research can also be affected by systematic errors. The research is considered to be valid if it is able to measure the factors that were intended for measurement (Flynn et al., 1990; Bryman & Cramer, 2005). Reliability and validity can be illustrated by using arrows on a target. If the arrows are spread over the entire target, the reliability is low. If they are gathered, but not close to the centre of the target, the reliability is high and the validity is low. All the arrows tightly gathered in the middle of the target signals both validity and reliability. There are three main types of validity (Arbnor & Bjerke, 1994; Bryman & Cramer, 2005; Gaur & Gaur, 2006); (1) Face validity – acceptance – are the results the ones that could be expected? (2) Internal validity – relevance “construct validity” - are the hypotheses correctly drawn from theory or previous knowledge (results)? (3) External validity – the ability to generalise from the results.

To ensure validity in this research, I have communicated my findings to my research objects or to other well-informed people within my network in order for them to corroborate my findings. I have also founded my hypothesis on relevant theory. With regard to the aspect of generalisation, I am well aware of the fact that the results cannot be taken as being generic outside the investigated programmes. Instead, I have presented them as indications in one or another direction. In cases where my findings correspond to the findings of other studies, I have considered my findings as strengthened.

3.2.6 Summary of my reflections over science and research strategy

To summarise my reflections on this first, and more philosophical, part of the methodology chapter, I consider this thesis as a scientific work. This is based on the statements made in section 3.2.1, where three important conditions of a scientific work were described. These have been fulfilled as follows: Firstly, through the purpose and the research questions into which the purpose has been broken down, I have stated that there is a problem or task to collect knowledge about. Secondly, through the research gaps found and showed, both in the introduction chapter and in the papers respectively, I have shown reasons for collecting this knowledge. Thirdly, by means of this method chapter, and the method descriptions in the papers respectively, it is shown that the way on which I have collected my empirical data, is based both on a systematic strategy and on conscious rules.

Another argument that is stressed is the importance of relating to the existing base of knowledge. As shown by my reference lists, the frame of reference and the literature reviews of the papers respectively, I have taken into consideration contributions of other researchers within this field.

The matter of objectivity has been discussed, and with regard to this I follow the referred sources in their argumentation that social science can never be objective or neutral. I also, along with the referred sources, believe in the importance of presenting my own values and experiences. I have started this research with the knowledge, understanding and skills that I had when I came to Linköping University in the late spring of 2003. Since then, I have learned a lot. Some of my previous knowledge has been reassessed, and other aspects have been validated. In order to comply with Myrdahl and his followers (mentioned in section 3.2.3), I have started this methodology chapter by a prologue in which I exhibit elements of my previous experience that I judge to have been most important for me as a researcher. In section 3.2.2, I have exhibited my view of the surrounding reality, i.e. my values. From this, it is possible for others (researchers) to judge if they agree or disagree that this work is scientific in its nature.

With regard to the choice of methods, it is my opinion that, as a base method, quantitative analysis works well with an analytical view of science, and that the research questions can be answered by combining empirical analysis with studies of literature and theory. A qualitative case study design may have worked as well, but, in this case, the nature of the data has been the most important factor underlying the choice of method, thereby this choice of

method. Finally, it is my hope that my findings will add to both the academic and the practical bases of knowledge within the field.

3.3 Choice of objects for the study and characteristics of the programmes studied

The objects chosen for this study are Sweden Innovation Centre (SIC), the Vinnova programme Vinn Nu and the support given by incubators. All three will be described in detail below. Additionally, the databases, upon which my findings are drawn, are summarised in Table 2 below.

The SIC programme was the first study object and the one that constituted the start of my doctoral studies. When we got the opportunity to take a closer look at the Vinnova Vinn Nu programme this was seen as an interesting way to expand the study, as the Vinn Nu programme gives interesting contrasts to that of SIC. Both the SIC- and the Vinn Nu programmes represent mostly configuration oriented support, and thus also adding the process-oriented support supplied by incubators expands the picture. If these three programmes are placed in Figure 2 on page 24, the Vinn Nu programme belongs in the area where all three policies overlap, and the SIC programme somewhere to the right of the middle of the early stage area and to some extent in the area where all three policies overlap. This is because far from all of the ventures supported by the SIC programme are research based. The incubators also belong on the right side of the early stage area, although, their exact positions depend on their individual aims (see paper 1). As an example, incubators which support the commercialisation of research end up in the area of triple overlap, while incubators geared towards creating regional growth probably ends up on the border or outside, like the SIC programme.

In the sections below, I will describe the chosen objects more thoroughly. However, I will first explain what unites them and makes them suitable as empirical examples for this thesis.

As shown in chapter 2, public support efforts can include soft aspects, such as advice and training, as well as harder aspects, such as finance and infrastructure. In chapter 2, this is categorised as configuration- and process-orientated support. In order to get a full picture of this public support it is important to study more than one type of effort (Lundström & Stevenson, 2005). Furthermore, according Lengrand (2006), to be able to give the whole picture of the investigated programme(s) normally requires a combination of methods.

The purpose of the programmes of SIC and Vinn Nu, and the support given by incubators is to support TBVs in the earliest phases of their development (see Figure 3 in section 2.7.1). Additionally, all the three support actors can help to answer the research questions since they match with the model for analysis by giving examples of goals, selection strategies and other model components. They also elucidate different aspects of outcome and evaluation. They are examples of policy programmes that fit within the scope of entrepreneurship policy, as they are aimed towards the early phases of

business development by dealing with support directed towards TBVs. Moreover, they are based on one or several of the rationales for policy interventions that are listed in section 2.5. Finally, the government finances them, totally or partly.

These factors, taken together, make the support programmes SIC, Vinn Nu and the support given by incubators suitable as research objects for a study such as this.

3.3.1 Sweden Innovation Centre²⁷

The aim of the SIC programme reads as follows: “Sweden Innovation Centre, SIC, supports innovators in their absolutely earliest phases of development – with financial capital, advice and networks. One of the objectives of SIC’s work is to create a better innovation climate in Sweden – a climate where people’s attitudes to innovators is positive. And where it is easy for an innovator to receive help to develop his or her concept to a commercialized product or service.” (SIC, 2002, p. 24)

The SIC programme was founded in 1994 by a governmental decision (862/94) and was then supplied with a fund of approximately 60 M€, which originated from the public federations of employees. In total, the SIC programme spent 122 M€ during the programme period, as its original fund was expanded through returns on capital investments. Of this 64 M€ were allocated to loans and subsidies, see Table 1. The purpose of the SIC programme was to give economic support to early stage innovations that were able to commercialise. However, as a step in the renewal of the Swedish trade and industry, the SIC programme was supposed to support innovation-promoting activities in order to enhance interest and understanding among people of the importance of innovations as a factor behind economic growth (SIC, 2004).

According to an interview with one of SIC’s former CEOs²⁸, the philosophy of the SIC programme could be compared to the work of a gardener. This implies that a lot of seed have to be planted and then the strongest plants have to be chosen and given space and nourishment so that they can grow and blossom in order to produce fruit for harvest.

²⁷ Where no other source is given the information is taken from information material, such as information brochures, application form and annual reports supplied by SIC

²⁸ Åke Wallin, CEO 1995-2001

Allocation of SIC programme funding on loans and subsidies										
	Conditional loans 1994 - 2003, (K€)									Subsidies
Year	1994	1996	1997	1998	1999	2000	2001	2002	2003	(annually)
	/95									1994-2003
Applications	495	659	829	780	781	913	894	960	552	4000
Supported	89	305	461	450	418	414	481	450	286	2000
Mean loan	27	19	17	18	17	18	19	20	17	1.4
Allocated, total	2360	5750	7850	8090	7230	7450	8920	8810	5000	2780
Paid back %	-	-	-	-	26	28	19	24	30	-

Table 1, Allocation of SIC programme funding. Source: SIC (2004) page 9

Due to the initial governmental decision, the activities of SIC were limited to a 5 to 10-year project period and its funding was expected to be consumed during this period. Today the SIC programme has been wound up (the official date was in September 2003) and the remaining funds were transferred to Almi, the inheritor of the SIC programme.

During its existence, the SIC programme managed four kinds of support activities. These were:

- *Innovation subsidies*, a financial grant without obligations of payback. The maximum supported amount was of approximately 4,000 €, but generally lower. The subsidy was supplied in co-operation with Almi that also co-financed 50% of the amounts allocated.
- *Conditional loans*, a soft type of loan, with the security put in the applying project. If the project gained commercial success, the applicant had to pay the loan back and if the project failed, the loan was written off. The maximum loan was approximately 44 k€..
- *Scholarships* have been characterized by varying size and varying purpose and were only accessible periodically.
- *Innovation-promoting activities* were support activities directed towards other supporting actors and activities, typically different kinds of networks, special activities and efforts, such as participation in trade fairs led by Almi and other organisations that promote trade and industry.

Subsidies, loans and the scholarships were available for applications for private persons as well as for new firms. However, firms were restricted to not being older than three years. The innovation subsidies were locally administrated by the “innovation centres” (normally hosted by the local Almi companies, but there were a few exceptions) in each of Sweden’s 21 counties. The other facilities were centrally administrated by the SIC office in Stockholm. To handle the applications, the programme used authorized consultants with knowledge of specific industries. These consultants were spread all over the country.

The rules for application were explicit: To get support, a project or an idea had to be (1) new, (2) able to be commercialised and, (3) technically or intellectually advanced. The instructions in the application form and its checklists were clear and specified explicitly which activities were supported and which were not. The second prerequisite was emphasised in the proposition (Prop. 1993/94:206) that preceded the inception of SIC. Furthermore, the SIC programme practiced a system with multiple loan applications where promising ideas were financed in steps.²⁹ The repeated funding is studied in paper 5.

The SIC programme focused on the type of ideas and projects that, according to the definition used in this thesis, can be labelled as technology-based and in early stages of development. It must be admitted though, that not all of the firms studied can be classified as high technology or have been created by engineers. However, based on the requirements of technological advancement and novelty that were set up by the SIC programme (SIC, 2004), it is presumed that most of the firms studied must be considered as working with new and innovative products or services or at least by means of the widest Schumpeterian definition of “carrying out new combinations”. Early stage businesses in line with the programme studied, are defined as firms or projects not older than 3 years.

3.3.2 The Vinnova Vinn Nu programme³⁰

The Vinn Nu programme was launched in 2002 by the governmental agencies Vinnova and Nutek. The programme came into being since the initiating agencies reached the conclusion that there was a need for a support programme dedicated to respond to the need for finance in the very earliest stages of firm development. From 2006 and onwards, the programme is being run and financed by Vinnova in cooperation with Energimyndigheten³¹. The aim of both these agencies is to contributing to sustainable national growth. According to these agencies, this aim will be realised through the development of the national innovation system. Additionally, Energimyndigheten aims at promoting a changeover to an energy system that is sustainable over time. The Vinn Nu programme operates in the very earliest stages of firm development, i.e. stages where interest from the private financial market is low; hence, the Vinn Nu programme can be regarded as a complement to the private financial market.

The programme aims primarily at industrial segments such as labour life development, biotechnology including medical technology and food, energy, information and communication technology, materials, product development, process technology, services, IT and logistics. The annual budget of the programme is approximately 655 k€. This sum is shared between 20 carefully

²⁹ Interview with Åke Wallin, former CEO

³⁰ The information is taken from our report to Vinnova (Norrman & Klofsten, 2006) and from the latest call for applications to “Vinn Nu” (Vinnova & Energimyndigheten, 2006)

³¹ Swedish Energy Agency

selected firms. To be selected, the firms must fulfil a comprehensive list of prerequisites (see paper 7). Besides this list, there is an additional list of selection criteria, by which the firms are measured. The selection process can be described as rather diligent and it is designed to fulfil the programme goal. This goal is to facilitate the preparation of- and shed light upon early, commercially interesting, development projects that are run by start-up R&D-based firms, so that these firms and projects can be developed and be able to attract follow on investments, and then grow into successful Swedish enterprises. The support is given in case of a single grant of 33 M€, that can be used rather freely, although 50% has to be spent on business development activities and 25% is allowed to be used as salaries for the employees within the firms receiving the grants. Besides these restrictions, the firms are free to decide on what activities to spend the money. Formally regarded, the VINN NU programme gives no additional support, such as advice or networking activities. However, there are informal contacts with the supported firms, such as information circulars and follow-up activities.

3.3.3 Incubators

The description below, unlike the descriptions of SIC and Vinn Nu, focuses on the theoretical aspects of the incubator phenomenon rather than on any specific actor. This is because our research on incubators in main, has mostly been conceptual. However, in paper 1 we have tested the proposed model on 16 Swedish incubators that have applied for and been granted financing from Vinnova.

Historically, incubators, as a general phenomenon, are rather new (Mian, 1997). They are often located or connected to science parks and in most cases, they also have close bonds with universities (Siegel, Westhead, & Wright, 2003). The first American incubator, however, was started in Batavia, New York, in 1959 (Hackett & Dilts, 2004).

The science park/incubator phenomenon per se, is said to have originated with the birth of Stanford Industrial Park in the early fifties. Frederick Terman is commonly recognised as its inventor and the Stanford Industrial Park was the first piece in what became the area that today is known as the Silicon Valley, situated between the universities of Stanford and Berkeley in Santa Clara (Huffman & Quigley, 2002). Silicon Valley has been the role model for science parks all over the world and the phenomenon is growing (Westhead, Batstone, & Martin, 2000). The first parks in Sweden - Mjärdevi Science Park in Linköping and Ideon in Lund - were established in the early eighties and today the number of parks has increased considerably.

In the literature concerning incubators and science parks, these two concepts are often mixed (see paper 1) and science parks and incubators are treated as being more or less the same thing (cf. Westhead et al., 2000;

Löfsten & Lindelöf, 2003; Phan, Siegel, & Wright, 2004). The definitions³² of science parks and incubators, given by their own organizations are also similar. Business incubation, according to these definitions, can be regarded as a part of the science park agenda.

Rather than choosing one of the various definitions suggested for the concept incubator (see paper 1), this study maintains that incubators can be viewed as "...a support environment for start-up and fledging companies" (Peters, Rice, & Sundararajan, 2004, p 83), although supplying the following facilities: (1.) Shared office space. (2.) A pool of shared support services to reduce overhead costs. (3.) Professional business support or advice (coaching), (4) Access to networks.

The main sources of finance for the incubator programmes studied are different types of governmental funding. However, the sources are often differentiated in terms of public actors. In Sweden, most incubators are owned and financed by actors such as Innovationsbron, Almi, universities and regional/local municipalities. There may also be private financiers and owners such as companies and private funds. The privately owned and run incubator Iqube, is one such example.

Regarding the literature about incubators, it is shown that incubators, just like the firms that they are nurturing, are different from each other (Allen & McCluskey, 1990). There are several reasons to start-up an incubator, besides those of making profits in the case of profit-driven incubators and renting out office space for those based on real-estate (Allen & McCluskey, 1990). Incubators are seen as tools to enhance innovativeness and to support entrepreneurship (cf. Hsu, Shyu, Yu, Yuo, & Lo, 2003; Lyons & Li, 2003), commercialise new technology (cf. Phillips, 2002; Lindelöf & Löfsten, 2004), and create societal growth (cf. Mian, 1997; Phan et al., 2004). They are also regarded as arenas where universities meets industry and transfer and merge

³² The denomination Science Park is here used as a synonym to Technology Park, Research Park, Business Park and other similar concepts (Löfsten & Lindelöf, 2003). Since this thesis does not deal with parks, the difference, if any, will not be discussed. The International Association of Science Parks has decided the following definition for science parks: "A Science Park is an organisation managed by specialised professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge-based institutions. To enable these goals to be met, a Science Park stimulates and manages the flow of knowledge and technology amongst universities, R&D institutions, companies and markets; it facilitates the creation and growth of innovation-based companies through incubation and spinoff processes; and provides other value-added services together with high quality space and facilities." (IASP International Board, 6 February 2002). The expression "Science Park" may be replaced in this definition by the expressions "Technology Park", "Technopole" or "Research Park"³³(Source: <http://www.iasp.ws>). Hackett and Dilts (2004) gives a comprehensive list of definitions of incubators. On the web page of National Business Incubator Association, NBIA, business incubation is defined as "a business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services."

(Source:http://www.nbia.org/resource_center/what_is/index.php) These conditions are agreed upon by a large number of studies. See also paper 1.

their knowledge by the creation of new ventures (cf. Mian, 1997; Phillips, 2002; Hsu et al., 2003; Rothschild & Darr, 2005).

Since the reasons for starting incubators differ, the goals and priorities of the incubators and their stakeholders also differ (Mian, 1997; Bhabra-Remedios & Cornelius, 2003; Bollingtoft & Ulhøi, 2004). The selection of incubatees is seen as important (Colombo & Delmastro, 2002; Peters et al., 2004) and the criteria for how this selection is made varies between incubators (Lumpkin & Ireland, 1988). As shown by paper 1, the business support models and the outcomes also differ between the different incubator programmes.

3.3.4 Overview of the empirical data

The Table 2 below gives an overview of the quantitative data collected and analysed for this thesis. I have created the databases, and collected the data for all of the below databases by my self, except for the STATA database, which has been created by Lars Bager-Sjögren at ITPS. I have however, supplied the SIC variables. Methods and techniques for analysis are described in the papers and studies where the data is analysed.

Data base	Content	Paper or study where the data is analysed
SIC conditional loan database Software: SPSS (Year of creation: 2003-2004)	5839 cases Generated from the computer-based SIC diary system	Paper 2 Paper 3 Norrman (2004; 2005)
SIC innovation subsidy database Software: SPSS (Year of creation: 2004-2005)	17722 cases Generated from a merger of the computer-based diary systems of 12 (marked in dark) of the provinces of Sweden	Paper 4 Norrman (2006)
SIC performance data base A selection from the SIC conditional loan database supplemented with annual accounting data, collected and supplied by MMP. Software: STATA (Year of creation: 2005-2007)	603 cases Limited companies Three groups; (1) single time supported firms (applied and supported once), (2) multiple times supported firms (applied and supported twice or more, never rejected) and (3), rejected firms (applied and rejected, never supported)	Paper 5



	For more information see paper 5	
SIC attitude database	154 cases	Paper 6
A selection from the SIC conditional loan database, (i.e. supported applications during 2002 and 2003), supplemented with survey responses Software: SPSS (Year of creation: 2005-2006)	Register data and questionnaire-based data (base facts and 7 degree, disagree/agree, Likert scales on attitude questions), collected by post, response frequency 36%	
	For more information see paper 6	
Vinn Nu database	Initial values, 90 cases	Paper 7
Supported firms 2002 – 2007 Software: SPSS (Year of creation: start 2005 -)	3-year follow up, 60 cases 5-year follow up, 20 cases	
	Questionnaire-based data (base facts, 5-degree Likert scales on development, opposite propositions, and on attitudes, disagree/agree), collected by telephone, response frequency 100%	
	For more information, see paper 7	
Incubator data	Qualitative analysis of goals and stake holders, business model components including selection, business support and innovation system mediation.	Paper 1 Norrman (2005)
41 applications for Vinnova Vinnkubator finance 2004, 16 of these were analysed Software: manual analysis		

Table 2, Databases used and their content

Besides information from the above databases, interviews have been performed with former SIC programme officials. Interviews have also been performed with the Vinn Nu programme firms that were supported in 2002. For details, see the papers respectively.

4 The process and the papers

This thesis includes seven papers, six, which have been peer reviewed, which means that they have been presented at conferences or been in review for academic journals. Three of the papers have been published. These seven papers are appended since they help answer the purpose and the research questions formulated for this thesis. As shown above, the papers appended investigate three types of support programmes, i.e. SIC, Vinn Nu and the type of support provided by incubators respectively. By investigating these support initiatives, I cannot claim that the entire area of Swedish entrepreneurship policy has been covered, nor the full segment of support for TBVs. However, this is an attempt to act in line with the argumentation of Lundström & Stevenson (2005), who suggest that evaluations should comprise whole policy areas, instead of being focused on single programmes, as this leads to fragmentation and thereby generates lower learning effects.

Besides covering multiple support initiatives, different, and sometimes overlapping, methods have been used in the papers. According to Lengrand (2006) this helps to get a full picture of the studied actor. The findings of the first paper, the incubator study, have shown to be useful in a context larger than merely that of incubator support. The SIC programme is the programme that has been most thoroughly investigated, i.e. in the first papers, quantitative descriptive approaches are used, then an econometric approach has been added and finally a survey-based investigation has been undertaken. The research into The Vinn Nu programme is survey based but undeveloped, because it represents ongoing research. However, it is my opinion that it adds to the understanding of entrepreneurship policy.

The presentations of each paper start with a short background description, including descriptions of the division of work behind each of the papers. This is followed by a summary of the paper. The order of these summaries follows the order of the papers.

4.1 Paper 1, Incubator best practice: A framework

4.1.1 History of paper 1

The idea behind this paper originates from my earlier working experience in Västerås Technology Park, where, just before I left, I wrote an application to get Vinnova funding for the park's incubator programme. After becoming a PhD student, I started to think about, and discuss with my colleagues how (and on what grounds) actors as Vinnova selected and decided which incubators to support. As a result of these discussions, during the autumn of 2004, Anna Bergek and I initiated the work with this paper, which we have written together. The first version was presented as a poster for Babson-Kauffman Entrepreneurship Research Conference (BCERC) 2005 in Boston. We also presented a first version of the paper at the High-Technology Small

Firms (HTSF) conference 2005 in Manchester. During the autumn of 2005, the paper was re-written and sent to the Journal of Technovation. This version was part of my licentiate thesis in 2005. Before it was finally published in the spring of 2008, it went through a final round of thorough revision.

4.1.2 Summary of paper 1

During recent decades, incubators have become a ubiquitous phenomenon in many parts of the world. One explanation to this is that policy makers on different levels regard them as a tool for promoting economic development, innovativeness and the emergence of new technology-based growth firms. The question of what return society gets on these investments has been raised and the issue of incubator performance has been addressed in several studies. However, when we reviewed the incubator literature, we identified two major problems within the present research. The first was that we found no consensus concerning the definition of *performance* and how it should be evaluated and compared. Second; most of the present studies have focused on the outcome of incubators, but without relating this either to the goals of the incubators or to how different incubators organise and manage their incubation processes. Taken together, these problems implied that a theoretical base or a framework for incubator performance evaluation in general and concerning the identification of best practices in particular was missing. Therefore the aim of paper 1 was expressed as “to develop a framework that can serve as a basis for identifying best practice incubator models”.

To fulfil this aim, a number of concepts must be defined: The term *Incubator* in this study is reserved for organisations that supply joint location, services, business support and networks to early stage ventures. *Performance* in the evaluation literature usually refers to the goal attainment of an actor. Previous research has focused primarily on identifying suitable criteria and indicators to measure outcomes, and as far as we understood, few studies related their outcome indicators to the goals of the incubator(s) studied. Although several sources have recognised that incubators differ, the incubators were usually examined as if they have the same outcome objectives. This failure to consider goals is problematic in two ways. First, it follows from the definition of performance that that comparisons should preferably be made only between incubators that have the same goal(s). Second, different goals correspond to different outcome indicators. Thus, if we fail to pay attention to differences in incubator goals, we cannot tell whether differences in outcomes are, in fact, the result of differences in practices, or merely of differences in focus between incubators. However, goals may be blurred and vague and they thereby may be hard to identify. To overcome this problem, we suggest that the focus instead should be put on the incubator model, as the model ought to be dependent upon the goals.

To be able to distinguish between different incubators based upon their models, we have developed a framework that consists of the three main components, *selection*, *business support* and *network mediation*. With regard

to the first component, selection, we found that incubators select their incubatees according to different strategies. To structure this, we put forward a four-field matrix consisting of two dimensions. The first distinguishes between selection focused primarily on either the idea or on the entrepreneur /the team. The other dimension considers the matter of flexibility or strictness in applying the above criteria. We identified the two main approaches; “picking-the-winners” and “survival-of-the-fittest”. In the former, incubator managers try to identify a few potentially successful ventures *ex ante*. In the latter, incubator managers apply a more open approach and take on a larger number of firms and rely on markets to provide the selection processes that over time will separate winners from losers. Combining these dimensions gives four selection strategies, which are likely to result in very different incubatee portfolios. A *Survival-of-the-fittest & idea*-portfolio will presumably consist of a quite large number of idea owners (or upcoming entrepreneurs) with immature ideas related to a broad spectrum of fields. A *Survival-of-the-fittest & entrepreneur*-portfolio will be diversified, and consist of entrepreneurs/teams with strong driving forces representing a broad set of ventures. A *Picking-the-winners & idea* portfolio will consist of thoroughly screened ideas within a quite narrow technological area – often originating from the research of highly ranked universities. Finally, a *Picking-the-winners & entrepreneur*-portfolio consists of a few handpicked and carefully evaluated entrepreneurs, commonly with ideas coupled to the research areas of a nearby university.

The next framework component is the business support service supplied by the incubators. We have judged activities related to business development and entrepreneurial training, including coaching and education related to business planning, leadership marketing and sales as being of most concern. We also found differences between incubators with respect to their degree of intervention, i.e. the intervention is on a scale between *strong intervention* and *laissez-faire intervention*. With regard to the former, the incubator takes the initiatives and for the latter, the incubator assists on the demand of the individual incubatees.

The final component is that of network mediation. By acting as an intermediary, *mediator*, between incubatees and relevant innovation systems, the incubator provides a “bridge” between the incubatee and its environment. Due to the alignment of the incubator, we have distinguished between *mediation* focused on regional innovation systems, technological innovation systems and clusters respectively.

As an empirical illustration, the framework was applied on 16 Swedish incubators that were supported by a government programme for incubator support. A first observation from this is that the framework, although our information was limited, showed to be applicable. It is also notable that the resulting number of categories was both limited and seemed meaningful. A second observation is that practices differ among incubators with similar goals. This indicates that there are different opinions as to how a certain goal

should best be achieved – even among incubators that all were successful in obtaining government support.

To conclude, the framework presented in paper 1 provides a tool to describe the incubation models of different incubators. In combination with suitable outcome indicators, it can be used to identify best practice models or to distinguish between different models that are equally effective in achieving certain goals. Both these results would help policy makers to decide which incubators to support and provide guidance for incubator managers in their strategic work.

4.2 Paper 2, Which new ventures get public sector innovation support? A study of early-stage financing from a supply side perspective

4.2.1 History of paper 2

This paper is the first fruit of the SIC project and the conditional loan database. The SIC project was the start of my research and it was financed by money from Nutek, which was obtained through the contacts of Elisabeth Sundin, who along with Magnus Klofsten, have co-authored the paper. With regard to the contributions of the authors, I, as first author, had the main responsibility for data collection as well as for the analysis and writing. Data collection and analysis were undertaken during the autumn of 2003. I then presented the paper at the High Technology Small Firms Conference, (HTSF) 2004 in Twente. After the conference, it was selected to be enclosed in an edited book (New Technology-based firms in the new millennium, vol 5) that derived from this conference.

4.2.2 Summary of paper 2

This study was undertaken since we found that there were few studies available on public seed funding for early stage technology-based ventures. Although it is well known that starting a new business, especially one of an innovative character, requires finance, the demand for and supply of financial resources are not always in equilibrium. This issue is not new and there has been an ongoing debate over the existence and relevance of so-called financial gaps. It is argued that new technology-based firms are especially likely to experience financial obstacles and that this is coupled to their characteristics, e.g. long periods between idea and market launch. Private venture capital is one source of finance; however, the VCs are market driven and therefore prefer to invest in firms that are relatively close to a market launch. This implies that early stages ventures often are left without funding. To cover this gap, it has been argued that public sector capital can be seen as a pump priming mechanism to trigger the input of follow-on private sector funding, and that the public and the private sector can be considered as complimentary. Public finance is stressed as important especially in situations with high risk combined with a lack of collateral assets, something that is common among knowledge intensive ventures. Conversely, there are studies

that argue that public support is socio-economically ineffective. As there are different opinions on this issue, it is important to investigate it further and to be able learn from passed experience. Therefore, the aim of this study has been to describe and analyse from a supply-side perspective, which ideas get public innovation support.

The study is basically quantitative and the results are drawn from a database, created from the diary of the support programme, Sweden Innovation Centre, SIC. This database comprises 5,839 applications for conditional loans, covering almost ten years, from the start of the SIC programme in 1994 to its winding up in 2003. The database is descriptive and contains information that shows facts about the actual applications and decisions. Due to the character of the data, the analysis has been limited to bivariate analyses of the included variables. To complete the quantitative study and to shed light upon the administration process of the SIC programme, we have supplemented the quantitative analysis by interviewing administrating officials of the programme.

A number of variables have shown to be significant during the analysis of the supported or rejected applications. The strongest results concerned the type of firm. In almost every case, limited companies applied for and were supported with larger amounts of capital, than other types of firms. Although the type of firm was no selection criterion, the officials of SIC admitted that there was often a correlation between well funded applications and stronger firm liabilities. The judgement group of Swedepark, that handled applications from ventures within incubators and technology parks also, answered in the same vein. It was also found that a technology-park manager recommended the start-ups to run their businesses as limited companies. This recommendation was based on an idea that a limited liability gives a more solid impression. Our findings hence support previous studies where limited liabilities are regarded as being better than legal forms that affect the owner's private economy. A limited liability is considered to give the owner an appearance of trustworthiness in the eyes of other actors.

Additionally, we made some interesting findings concerning gender aspects. We did not find many significant differences due to gender alone, and the differences found tended to correlate with the differences due to legal form. However, there was one major difference between male and female applicants, with regard to legal form: Females were more likely to run their businesses as sole proprietors. Two thirds of the females, compared to slightly more than 40 percent of the men applied as sole proprietors, and only 25 percent of the females, compared to 44 percent of the males applied as limited companies. When we checked the legal form of the companies, it was shown that females with limited companies were the significantly most successful group in gaining support for their applications. Although that the number of applications from females was quite low, we can state that female innovators and entrepreneurs were not discriminated against when they made an application. Hence, contributions to promote female ventures must come earlier in the innovation or entrepreneurial process.

Finally, the support rate (on average 57%) was considered to be high. The most possible explanation for this is the support system in itself, which has proved to be discouraging due to its funnel-formed process and its conditions. Thus, if the whole process is taken into account, i.e. from the initial contact to those that manage to receive a loan, the dropout rate is quite large.

The main conclusions from this paper can be summarised into the following bullet points:

- The type of company or e.g. the legal form of the company is the most important factor for gaining support.
- No big generic differences were shown due to gender, except for the fact that females apply as sole proprietors in larger numbers.
- The rate of support was high if we consider the threshold for applications, but low if compared to the number of initial contacts taken by potential appliers.
- A future support system must incorporate the best parts from the old system.

4.3 Paper 3, Seed funding for innovative ventures: A survey of selection mechanisms of a public support scheme

4.3.1 History of paper 3

This paper is also a fruit of the SIC conditional loan database, however with a slightly different focus. It is co-written with Magnus Klofsten, and the division of work has been similar to that of paper 2. A first version of the paper was presented at the BCERC conference in Glasgow 2004. The paper was then revised, and sent in to an academic journal. After being in review for almost two years, it was rejected. It was thoroughly revised and repackaged and then sent to the *International Journal of Entrepreneurship and Innovation*, where after an additional round of revision, it was published during the spring of 2008.

4.3.2 Summary of paper 3

In entrepreneurship research, the financial aspects of new venture development have, traditionally, been of high interest and it has been shown that most new ventures finance their start-up using their own assets. In some cases, especially where the product requires extensive development before it can be launched on the market, personal savings are not large enough to cover the costs however. To further complicate the situation, these ventures often lack both a track-record and collateral assets, which implies that they face difficulties in obtaining external finance. These obstacles, in combination with a societal desire for growth and development, rationalises for public support initiatives. Governmentally funded programmes or schemes have therefore been designed – all over Europe – to support emerging innovative ventures with both finance and advice. Due to the agenda of the European Union, it seems that these actions will continue also in the future.

Since large amounts of money are dedicated to publicly funded support initiatives directed to emerging private ventures, we are curious about which ventures receive this support and which do not and what determines the decisions, i.e. the selection mechanisms of the publicly funded schemes and programmes. There have been many studies into how private investors select what ideas to invest in but in the case of the selection of public actors, we found a gap in the research. Therefore, to contribute to the knowledge about selection mechanisms among financiers, the aim of this study is to investigate and discuss what mechanisms that influenced the selection of early stages ventures for support among a public support actor, i.e. in cases where the only substantial ingredients are diffuse ideas and motivated individuals. This has been done through a Swedish case

This paper is explorative and uses a quantitative method approach. The analysis is drawn from an SPSS-database of 5,839 cases, created from a dataset (i.e. a diary of conditional loan applications) provided by Sweden Innovation Centre, SIC. The database contains a number of descriptive variables such as: applicant characteristics, amounts applied for and supported and using areas. The tools for the analysis used have been limited to bi-variate analysis.

As the theoretical foundation for analysis, the four-field model of incubator selection strategies that were developed in paper 1 has been used. According to this model, selecting ventures for incubators can be based on either the entrepreneur or the idea (or on a combination of both). Incubators can also be designed in order to aim broadly, (i.e. to let the market discriminate, something they refer to as survival of the fittest) or to pick the idea or entrepreneur with the best potential (i.e. a picking the winners approach). The latter often includes extensive evaluation procedures.

Applying this model on different types of financiers shows that their selection strategies differ. Venture capitalists, whose rationale for investment is market driven and coupled to the estimated presumptive return, can be said to have a picking the winners approach, focusing both on the entrepreneur(s) and on the idea. Public support programmes that aim at early stage venture development on the other hand, are more likely to use a survival of the fittest approach, as they are rationalised by political goals of facilitating the emergence of innovative ventures. In the case of the programme studied, SIC, the selection was outspokenly focused on ideas, which implies that the SIC programme are to be found within the survival of the fittest – idea square.

With regard to this categorisation, it is interesting that the factors that emerged from the analysis were the importance of legal form, industrial sector and to some extent gender. Of these, the industrial sector is the only factor that can be coupled to the idea per se. Legal form and gender are merely linked to the venture and the innovator/entrepreneur. The fact that an outspoken idea driven organization was greatly affected by factors not central to its core is interesting. This result has therefore led us to argue that the selection criteria have been both tacit and expressed. The fact that the analysis has been limited to quantitative data is a drawback in this case, since it implies that we cannot fully explain our results.

4.4 Paper 4, Public innovation support and innovative ideas

4.4.1 History of paper 4

During 2004, the SIC project was expanded, this time through finance from SIC and Vinnova. This resulted in a database of innovation subsidies. Magnus Klofsten, Anna Bergek and my self authored the paper during 2004. During this work, I was first author and responsible for data collection and analysis. We worked together around the theoretical framing. The paper was presented at BCERC 2005 in Boston. For several reasons, this paper was never further developed and it has not been submitted to any journal.

4.4.2 Summary of paper 4

The creation and growth of new ideas into sustainable businesses has been recognized as one of the most important factors for economic growth, and as a key component in achieving innovation in society. It has also been recognized that one of the most critical conditions for new venture start-ups to be able to pursue growth opportunities is access to various types of financing in the very early stages. However, young firms that are in the beginning of a growth phase often have problems accessing such initial and very essential capital. Financing the very first idea and developing the firm with the capital of the owner manager is generally not an alternative, since these resources are usually either exhausted or too small. Furthermore, young firms seldom attract external capital, due to their lack of credibility, short business history and an absence of steady cash flows. Hence, in new firms, a mismatch between demand and supply of financial resources, that can be termed a “financial gap”, often arises between the earliest stages of development and the time for market launch. Because of the expressed need of early-stage financing, and the need of new innovative ideas to ensure sustainable societal growth, there is an increasing debate about the role of the government and the supply of various forms of public financing on the market.

There are several reasons for the more intense focus on governmental involvement in the financial market, something which, traditionally has been an arena for venture capitalists and other private investors. First, experience shows that private venture capitalists neglect investments in the very early stages of firms’ life cycles due to the high risks involved. Second, even when financing is available, there may be reasons not to use equity-based financing in the very early stages, the primary one being that the entrepreneur might benefit from the freedom to test the idea on the market without the pressure and involvement of an external owner. Third, another way of getting access to financing, commonly used by new ventures, is to develop close relationships to customers as early as possible and let them take part in the financing of the new product. Studies have shown that small-scale public financing to facilitate such relationships might in fact be one of the most advantageous financial solutions for new ventures.

However, as far as we have seen, there has been relatively little research conducted on the public financing of innovative ideas and new ventures. In

particular, documentation summarizing experience from existing or past initiatives of such public financing is scarce. The aim of this paper is to develop new insights about how public financing works in a market that creates and develops new innovative ideas. We are especially interested in how industry type affects which ideas gain public support, and how these results correspond with the theories of entrepreneurship, innovation and growth.

This paper is based upon hypotheses that have been tested by a quantitative analysis of an SPSS-database containing innovation subsidy records and which was created from a dataset provided by the regional innovation centres of a Swedish support programme, Sweden Innovation Center (SIC). The database contains 17,722 applications that have been obtained from registers provided by 12 (out of 21) counties in Sweden. As the database is of a descriptive character, the tools of analysis used have been limited to frequencies, cross tabs and comparisons of means. For classifications of the data, we have used cluster analysis.

Based upon relevant literature, we hypothesized that: The amount of public innovation subsidy supported by the public financier was related to: (1) industrial sector; (2) degree of knowledge intensity, (2a) degree of education intensity and patent intensity of the industrial sector, (2b) degree of education intensity of the industrial sector, and (2c) degree of patent intensity of the industrial sector; and (3) legal form, i.e. limited companies attract more funding than sole proprietors.

The first hypothesis was supported to some extent, as we found that certain industries, namely *R&D and Education* and *Computers and IT* have received significantly higher amounts than any other industry. These industries have also been identified as growth industries, a fact that might have affected the decisions to give support. With regard to the hypothesis 2a, we found that ideas, belonging to industries recognized by high patent and knowledge intensity, were more successful than other industries. Also hypothesis 2b was supported, however concerning 2c the result was less clear cut. Finally, for the third hypothesis, this study confirmed that limited companies attract significantly larger amounts than all other legal forms.

To summarize, our findings were that there is not one simple and obvious explanation for the differences in the amounts received by different ideas, as it is impossible to separate the effects of the different variables from each other.

There was, however, a strong correlation between the venture's legal form and the amount of funding it received. However, the number of limited companies was not very high and limited companies are found within all clusters, which imply that the legal form in itself is not the only determinant of success. Instead, it seems that strong legal forms strengthen strong types of industries. Stronger legal forms also seem to be related to knowledge intensive ideas. Finally, the industry perspective cannot be left out entirely, although we will leave to future studies to explain why. From this study, we can only conclude that there is something more to industry than knowledge intensity and legal form.

4.5 Paper 5, Public Support to Innovative Ventures: Does it have any Impact?

4.5.1 History of paper 5

This paper has been jointly written with Lars Bager-Sjögren, who is Senior Economist at the Swedish Institute for Growth Policy Studies (ITPS). We got to know each other through his work with an ITPS report, for which I was part of the reference group. After this report was finished, we decided to dig deeper into the issue of how to track the impact of public financial support. The paper is based upon the SIC conditional loan database, although the SIC data was complemented with annual report data. The distribution of work was such that Lars had the main responsibility for the production of statistics, while I have had the main responsibility for the writing. We carried out the data analysis together. A first version of the paper was presented at the Nordic Small Firms Conference (NCSB) 2006 in Stockholm. The paper was then re-written during the winter and sent in to a special issue for *Entrepreneurship Theory & Practice* in the spring of 2007. We received review comments during the early autumn of 2007, where we were asked to revise and resubmit the paper, which we did. We received new review comments in February 2008, which demanded revisions concerning the theoretical funding of the hypothesis and the language. However, as the time schedule for the revisions co-incided with the finalising of this thesis, it forced us to withdraw the paper from the E&TP special issue. As soon as there is time, however, we intend to follow the comments received, rework the paper, and then submit it to another journal.

4.5.2 Summary of paper 5

This paper is founded upon an interest in the longitudinal effects of entrepreneurship policy (i.e. policies that focus upon motivation, opportunity and skill, and covers all stages of venture development from pre- to post-start), in terms of financial venture support directed towards the earliest stages of firm development. Finance, especially if directed to SME firms, has been targeted by several studies. However, studies into financial support that is specifically directed to the very earliest stages of firm development, and where the only substantial ingredients are a more or less good idea and an innovator/entrepreneur, seem to be rarer. Furthermore, as far as we have seen, most evaluation studies of early stages ventures are based upon questionnaires of ventures supported, i.e. self-estimations, and these studies generally show a positive impact of the surveyed programs. It is also shown that most evaluations undertaken have a rather short-term approach, which implies that the full effect may not yet have emerged, and this reduces the prospects of learning from previous policy measures. Reliable evaluations are asked for by policy makers, since in order to measure the success of policy programmes it is of interest to measure costs against their benefits. There is also demand for more knowledge, and for the identification of early, consistent, reliable and cheap information that can serve as base for evaluations.

In order to respond to the research gaps referred to above, this study aims at investigating the impact of a policy programme directed to early stages innovative ventures. This study was undertaken by means of attempting to identify the existence of additionality, i.e. to identify whether a public programme really may be said to have rendered any impact on the economic performance of the supported firms. Two main hypotheses were formulated: (H1) Supported firms perform better than rejected firms. (H2) Firms supported two times or more, perform better than supported only once. These hypotheses were measured through the following four sub-hypotheses: Supported firms (a) show higher commercialisation incidence (b) show larger average sales, (c) have larger total assets, and (d) generate more employment than rejected firms.

To test the above hypotheses, we have used a quantitative approach of matching that implies the creation of a quasi-control group to which the supported firms are compared. This quasi-control group consists of firms with empirical similarity in determinant variables. From 5,839 applications for SIC conditional loans, we focused on the applications filed by limited companies, since these were able to be supplemented with accounting data (i.e. 2,577 applications made by approximately 1,800 individual firms). After removing cases of insufficient quality and cases where economic activity was displayed during the three years prior to the application, our final selection consists of 603 applications filed between 1994 and 2003. Of these, 378 cases were supported once, 132 cases were supported twice or more, and 93 cases were rejected. Accounting data is available for 2006 and backwards, which means that we have data to allow for follow-up of eight years, depending on the year of application. The number of valid observations decreases for each year of follow-up.

In the impact analysis, the difference between the supported firms and the firms in the created counter-factual were estimated (in cohorts) annually, for a period of 1-8 years after the year of application. This has been done using an application for the STATA package (see Abadie, Drukker, Herr, & Imbens, 2004). For the matching, the following variables were used; revenue level at the time for application, number of employees at the time for application, amount of private equity at the time of application, and industry classification at the time of application.

When impact is estimated, it is of importance to check for bias. All of the firms studied have applied for funding, which implies that self-selection bias is eliminated. Administrative selection bias (i.e. bias generated by officers selecting firms that they believe more suitable than those not selected) must also be considered in order to evaluate the benefits supplied to supported firms by the program. Significant correlation was noted between the amounts of capital held by the firms and being selected. This motivated the use the amount of private equity as a conditioning variable for this “administrative bias”.

With the exception of an increased generation of jobs among supported firms, the findings of our first hypothesis, supported firms perform better than

rejected firms, shows that there were no measures that revealed any significant difference between supported and rejected firms, that could be coupled to the program. For the second hypothesis, which concerns the difference between multiple and single supported firms, the result is less than clear-cut. There is a difference with regard to the sales incidence, however the size of sales tells an opposite story. Concerning the remaining two measures, most of the estimates show in an opposite direction of the hypothesis.

Without checking for administrative selection bias, the average sales estimates show substantial differences between supported and rejected firms, although, when bias was checked for, these differences disappeared. From a selection point of view, this is highly interesting. According to the literature, governmental support actors are not recognized as being experts at selecting winners. With regards to the case of SIC, the applicants were in immature stages. Furthermore, small resources were spent on evaluation, both with regard to the time from the filed application to the decision (38 days on average) and money (average cost 650 €). This leads us to suspect that the impact of the programme has been affected by randomness.

Although the aim of SIC was to enhance commercialization, most of the money lent out was dedicated to product improvement or protection, and only a minor part went to marketing. In paper 6, the lack of market focus was regarded as a weakness. This focus on product development and protection might be one explanation as to why additionality, in the form of economic performance due to this program, not has been found.

To summarise, our analysis is based on objective data, which must, according to law, be controlled by external auditors. We thus regard our results as reliable and valid, and draw the conclusion that this study demonstrates that impact can be traced and measured from annual report data. Summarizing the results of the study, the following conclusions can be reached:

- The evidence of any impact from the support to early stages ventures given by the public programme SIC is weak or non-existent.
- On the other hand, the higher ratio of outliers in the supported groups might indicate other results, if the time span is prolonged above 8 years.
- Our test of the projects which programme officials considered as most promising, did not support their belief.

As a clear policy implication, our findings suggest that public actors will not benefit from making efforts to pick winners at early stages, where information is limited. Hence, we conclude that this ought to be left to stages where firms are more developed, as picking winners requires both resources and information. It might also be an issue of building winners. We argue, along with previous studies, that it is highly important that policy makers ensure that their programs have developed evaluative awareness, and in accordance with this defines a clear counter-factual to measure against. Proper prerequisites for the evaluation and clearly stated measurable goals and

indicators are factors, which also facilitate follow-ups. Furthermore, it is our recommendation that public support programs should be required to present data collection strategies.

4.6 Paper 6, What can be expected from a Public Venture Support Programme?

4.6.1 History of paper 6

This paper originates from the SIC project (conditional loans), and it was produced to deal with some of the issues of further research that emanated from my licentiate thesis 2005. The paper is co-authored with Magnus Klofsten, using the same division of work as for paper 2. The data was collected during 2006 through a survey. The first version of this paper was presented at the HTSF conference Manchester in 2007. The appended version have been revised since the conference and in its current state, the paper is under review for "International Journal of Entrepreneurship and Innovation".

4.6.2 Summary of paper 6

During the past decade, we have witnessed an increased number of public programmes to facilitate entrepreneurship, venture start-up and growth; however, these efforts are not without critique. Those who are in favour of public financing believe that, with the right tools and governance, public support is an important complement to the private financial market, whereas their opposers state that the main issue is not the lack of available money but the lack of ability among entrepreneurs to convince investors to get involved in their businesses. There have also been arguments against the socio-economic efficiency of public support efforts. A majority of the investigations into public support programmes considers support to SME firms. There are also investigations into public support that concerns advice. However, the number of studies of public support to the earliest stages of venture development in general, and to finance in particular, seem to be limited.

This study, which is part of a larger study of public support from the Sweden Innovation Centre, SIC, was designed to fill this knowledge gap. Our previous studies are based upon secondary data, and have focused on the supply side. In order to expand our knowledge and to capture the whole programme, we addressed the demand side. The literature shows that new ventures are in the need of support in certain critical areas, such as networking, credibility and business development in general. Consequently, public support initiatives could be expected to target these factors. It is also shown that there is often a mismatch between supply and demand/the actual needs with regards to the support given and its content. The aim of this paper therefore was to investigate to what extent outcomes that could be expected from a public support programme match the actual outcome. We are also interested in whether the supply of support matches the needs and demands of the receivers.

Methodologically, this paper is survey-based and analyses ventures that have received conditional loans from SIC. During 2006, the questionnaires were sent out to all those ventures that, according to SIC programme diary system, applied for and were supported with conditional loans during SIC's final years, 2002 and 2003. During these years, 1,228 applications were filed, of these around 570 were supported. The total sample, after removing duplicates, and those for which there were no correct addresses found, was 434 ventures. Of these, we received responses suitable for analysis from 154 (36%). We consider this response rate as satisfactory. The questionnaire consisted of three parts; basic facts about the applicant, statements through which we investigated the attitudes of the respondents, and finally, two open ended questions where we asked for three advantages of the SIC programme and three suggestions for improvement. The data have been analysed through hypotheses, and tested through bi-variate analysis using SPSS 14.0.

The hypotheses, from which this paper draws, are based partly on information about the programme (i.e. that the SIC programme supplied finance, advice and network), and partly upon what the literature advocates as being crucial factors for early stage ventures. We hypothesise that public innovation support directed to new ventures will: (1) increase the motivation of the supported entrepreneur(s), (2) increase the credibility of the entrepreneurs supported and their ventures in the eyes of external actors, (3) enlarge the network of the supported entrepreneurs and, (4) have a positive effect on the business development of the supported entrepreneurs and their ventures. Besides these hypotheses, we address the issue of whether the ventures that applied really got what they asked for, or what theory tells that they need, when they received public innovation support.

The major outcome of this study is first to substantiate that there is a demand for public innovation support to early stages ideas per se, and that the support given was regarded as a prerequisite for the implementation of the projects supported. Furthermore, a large number of the supported ventures were satisfied with the loan conditions and the way in which their applications were treated. With regard to the hypothesis, it was shown that the first one, which concerns motivation, was corroborated. It seems that the support encouraged (motivated) the supported firms to continue. This finding suggests that one important role of public support may be to actually encourage early stages ventures to continue.

As it seems, the ability of the programme to transfer credibility (hypothesis 2) to the supported ventures was low. This is in contradiction to previous findings that showed that small sums of publicly funded grants increased the credibility of the recipient in the eyes of other financiers. This contradiction might be coupled to the selection process of the programme studied (i.e. that the selection was not diligent enough). The programme studied stated that networking (hypothesis 3) was one of its three main tasks and hence, one would have expected to find a positive impact among the firms supported, at least with regard to the ability to create networks, since such activities are rather cheap compared to other actions. From our findings, however, we

cannot argue that the SIC programme contributed in this area. The fourth hypothesis (H4) investigated business development. If all the variables of this measure are taken together, the support for this hypothesis is weak or nonexistent. If the measures are considered one by one however, the measure *development of the product idea* stands out. A large majority agree fully or partly with the proposition that the SIC programme have contributed in developing the business/product idea. The ambition of the programme was to create a better innovation climate by helping innovators to commercialise their products. The analysis shows that the main focus was on product development and the protection of products. It is also in these areas the competence of the programme seems to have been the strongest.

For an application to be accepted, the programme stipulated that three important conditions needed to be fulfilled (i.e. that the idea was new, it was technologically or intellectually advanced and that it were able be commercialised). From interviews with the SIC programme officials we know that the third condition *able to be commercialised* was most important during the latter years of the programme. These coincide with the years studied. However, it seems that more could have been done. Our findings showed that there was a mismatch between the support given and the support needed/demanded. This mismatch was caused by issues which concerned the market.

New ventures are often oriented towards product development, but for the ventures to be sustainable, their products have to gain acceptance among their customers. The market is the primary resource base, and hence it is crucial that a large enough market is defined at an early stage. Furthermore, it is shown that ideas change when they are communicated to customers. To us, this implies that the product development has to be market driven. If the market is neglected and the venture focuses solely on their new technology, there is a risk that money and time are invested in vain. A reasonable explanation for the shortcoming of the SIC programme in this area is that product development as such is more hands on, technically oriented and narrow, in comparison to the whole process of idea commercialisation including customer adaptation and sales. This holds especially if we assume that the skills as well as the interest of most innovators are in their technology. We also know that a large number of the advisors that were connected with the SIC programme had their background in the Swedish Association of Innovators (SUF), and that several of them had a past as inventors themselves.

The practical implications of this paper are as follows; firstly, inline with the comments on the open-ended questions, we argue, that in order to succeed in supporting new ventures, it is crucial to have an approach that comprises both the development and protection of the product and its market and customers. This can be solved through dedicating a certain part of the financial support to marketing development and customer contacts. Another way could be by supplying good quality entrepreneurial training, where the idea owners both get the tools they need and an understanding of what they

have to do in order to reach the market. Secondly, we know that accessing new markets with new products is coupled to high risk, and we therefore argue that long-term commitment from advisors and financiers are of importance.

4.7 Paper 7, Some findings from the ongoing study of the Vinnova Vinn Nu programme

4.7.1 History of paper 7

The follow up studies of the Vinnova Vinn Nu programme were initiated 2005. The first step was a 3-year follow-up of the firms supported during 2002 and 2003. The work was continued during 2007, and firms supported in 2007, 2006 and 2004 were added to the investigation. The Vinn Nu project is best described as a piece of ongoing work, and no academic papers have therefore been prepared yet. A report on the first part was prepared during the autumn of 2006 and a follow-up report is under production. Additionally, we have reported results continuously to Vinnova. Paper 7 comprises a description of the Vinn Nu programme and shows a summary of the results obtained this far. The reason that I have included this immature work in the thesis is because the Vinn Nu programme embodies an interesting contrast to the SIC programme (i.e. due to factors such as its narrow focus on R&D based firms and its selection process). Furthermore, this research is an example of an effort to develop new methods for evaluation.

4.7.2 Summary of paper 7

The focus of this paper is on the outcomes of the public support programme Vinn Nu, which is a seed finance programme for start-up research based firms. The programme had its inception in 2002, and is now run by the Swedish agencies Vinnova and Energimyndigheten. The rationale, upon which the programme is founded, was a recognition (by Vinnova and Nutek, that created the programme) that there was a short supply of finance for R&D based early stage ventures.

Public intervention in private venturing has been a matter for discussion. To create efficient support programmes, the policymakers need knowledge about how their support programmes work. During the recent decades, the evaluation of public interventions has been on the agenda both internationally and nationally. On the national level, there has been a demand for new and improved evaluation approaches.

Growth- and development processes can be studied from several perspectives. In this study, we have taken our point of departure in a vulnerability perspective. To do this we have used the business platform theory. This model is based on an understanding that generally, new and small firms are highly vulnerable and that the early processes of firm development can be investigated on a basis of the degree of maturity exhibited by the venture. The view that firms have to reach a business platform, which is a state where the firm has over come its initial vulnerability, is an

understatement of this theoretical model. The business platform is by no means the final goal, neither does it guarantee success, but it is an important step on the firm's path to sustainability.

Based on the goals of the programme investigated, and on the theoretical start points addressed above, the purpose of this follow-up study has been set as to investigate firm development among supported firms, by using the business platform model, i.e. if, and in such cases how, the subsidised firms have developed since they got the grant. We also aim to map the subsidised firms' attitudes to the Vinn Nu programme. Finally, based on the findings from our investigations of the Vinn Nu programme, we will try to give comments and recommendations.

The quantitative data was collected through a questionnaire-based survey to all the firms that have been supported support through the programme. The questionnaire consists of four main bundles of issues. The first one, basic facts, was created in order to provide basic information, such as facts about the firms and facts about the founders. The second part was designed to measure development according to the "business platform" model. For third and fourth parts, surveying attitudes, the same questions that were developed in paper 6 were used. For the 5-year follow up, the quantitative data collected initially and after 3 and 5 years has been supplemented by telephone interviews. The response rate is 100 %.

With regard to the results, it must be underlined that this work is an ongoing project. To be able to publish our results, we need a more thorough theoretical anchoring including both a review of the literature and a foundation of the method. We also need to enlarge our data so that reliable statistical analysis could be undertaken. This will be done. Although there is still a lot to do, we have achieved some important results. First of all, we have implemented a new method for evaluation, i.e. the business platform approach. This method can further be refined, but we are convinced that the information that we have obtained is useful in fulfilling the purpose that was set for this project. With regard to learning, it is our opinion that the combination of quantitative and qualitative techniques is useful. This is also in line with other sources that in fact suggest that a combination of methods and techniques often is required to give a full picture of a programme.

As far as the result of the programme is concerned, our findings indicate that it seems to be successful. We believe that the Vinn Nu programme attains its goals, and on average, the firms have developed positively. However, to estimate the outcome of the programme, in case of its efficiency, we need, as suggested by Storey, to make comparisons to a counter-factual. The approach in paper 5 would probably be a good way to proceed in such an attempt.

5 Discussion and analysis

In the below text, the research questions will be analysed and answered in the same order as they were presented in the introduction chapter. A short summary of the main findings will be provided in the end of each research question.

5.1 How can public programmes to support TBVs be justified, and what are their goals?

The TBVs, and particularly the support programmes directed to this type of ventures, are the units of analysis of this thesis. I will therefore start by showing what rationalises public support programmes such as those studied, both from the policy makers' and the ventures' perspective. After this, I will discuss and analyse the overall aim of such support programmes. Finally, programme goals on a more operative level will be analysed.

5.1.1 Rationales for- and purpose of public TBV support programmes

It is argued in chapter 2, that to justify public intervention into private ventures the reasons must be strong. Furthermore, it is argued that public support can only be rationalised as something complementary to the market, otherwise there is a risk of unfair competition, i.e. that publicly funded initiatives are crowding out those that act on market conditions (Parker, 2007). The role, played by public support actors in complementing the market is also recognised in practice, and as example can be mentioned actors such as the Vinn Nu programme (see paper 7) and the Swedish actor Innovationsbron³³, that describe their roles as complementary and bridging.

What then, is a strong reason? In this thesis (chapter 2), I have divided the rationales for intervention into two types; those based on societal desires and those based upon barriers faced by the targeted ventures. Examples of the former are for real or desired, prospects of societal growth and development, innovation and job- and wealth creation. Such desires are far from groundless, and within research, there is in fact plenty of evidence showing the potential of technology-based firms in terms of e.g. product invention, technology transfer and job creation - both within their own firms and within other firms. Additionally, it is acknowledged that TBVs play an important role in the transfer of technology.

With regards to the second type of rationale, market failure is the rationale that has been the most investigated (see chapter 2), especially in connection with public actions of entrepreneurship- and SME-support. This phenomenon can appear as a consequence of the difficulties involved in evaluating the

³³ See the website of Innovationsbron, (<http://www.innovationsbron.se>)

potential of early stages ideas and because of information asymmetry in general. This, in turn, leads to that private investors tend to avoid ventures in early stages of development, since these are recognised as being of higher risk. Instead, they invest in firms that are closer to a market launch. Banks are commonly no option for early stage ventures either, as obtaining a loan requires collateral, which the new ventures are not able to put up.

However, it has also been recognized that financial and other constraints faced due to the immaturity of the venture cannot fully be explained as effect of failure of market per se. This is because the avoidance of making investments in undeveloped ventures may be fully rational, from a market point of view. However, this risk avoiding behaviour implies a problem, as it constitutes a barrier for developing ventures. It is a fact that the thin out among new venture ideas is large, and hence that far from all of them are carried into practice. In most cases, this is rational or natural and something to be expected rather than pitied, as wasting resources on ideas that lack use or market is meaningless. In some cases, on the other hand, the ideas are good and worth working for, and thus it is problematic if the constraints are to large and wide spread, as they may then prevent innovation and societal development. Furthermore, these constraints may turn into a serious early stage “resource gap”, especially if neither private investors, banks, or the public actors are willing to invest resources (cf. Oakey, 2003). In such cases, public support can work as a complement to the market and strive to bridge the funding gaps for the ventures that are considered promising from a societal perspective but which, due to reasons such as high risks, are unattractive in the eyes of private actors (cf. Storey, 2003).

Solely regarding phenomena such as market failure or firm failure however gives a fragmented picture of the role of entrepreneurship policy, and to remedy this, I suggest that a broader perspective is applied. Theoretically, the early stage venture development process can be explained by applying theories on resource dependency in combination with an IS approach. To reach sustainable development, firms need both to get hold of, and to be capable of utilising crucial resources efficiently (Barney, 1991; Klofsten, 1992, and paper 7). This entails that ventures cannot develop autonomously and isolated from the world around them, i.e. from the IS of which they are part, and which constitutes their external resource base (Barney, 1991; Klofsten, 1992; Van de Ven, 1993; Edquist & Johnson, 1997). In fact early stage ideas start developing seriously when the idea owners become receptive to the surrounding world (Klofsten, 2005). In the IS, ventures can develop through obtaining physical capital, such as payment from customers and, if needed, additional finance from other external sources such as business angels³⁴ and venture capitalists. They can also obtain or develop their human capital by interacting with actors such as customers, partners and external advisors. Furthermore, they can increase their human capital by organic growth (by

³⁴ Business angels are wealthy and experienced private individuals that invest in, and take an active part in the management of developing firms (cf. Mason & Harrison, 2004; Mason & Stark, 2004)

adding employees) and by educating the existing personnel. Through this physical and human capital, the organisational capital³⁵ can be increased, as innovative product ideas can be patented, processes can be developed and brands could be established on the market, and so on.

Based on this perspective and expressed in theoretical terms, the main task of public support to TBVs becomes to help the supported ventures, to better link to their surrounding IS, from where they can get the external resources crucial for survival and sustainable development, as suggested in Figure 4.³⁶ Through support programmes, firms receive support so that, in different ways, they can develop and leave the immature stages, attract resources and reach sustainable development and growth. An increased degree of IS linkage is thereby synonymous with an increased degree of business maturity of the venture.

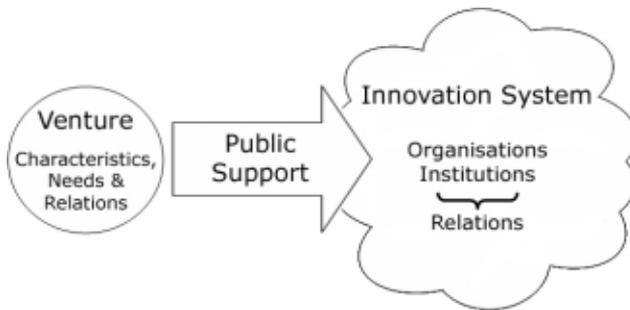


Figure 4, The goal of the public support to TBVs

Practical examples of ways in which public actors can facilitate the linking process could be through measures such as finance to develop or protect a product, or to investigate or work up the market and develop the business concept. Advice about how to decide in critical situations, education, coaching and training to improve competences are other ways in which this can be done. To summarise, support is about measures that increase factors such as investment readiness, motivation and driving forces of the entrepreneur(s), and the credibility of the entrepreneur(s)/venture. All these factors make the venture “more attractive” in the eyes of external actors such as customers, investors, suppliers, partners and presumptive employees, and hence enable the linking process of the venture. These and other examples will be further discussed in the following.

³⁵ Barney (1991) names three types of capital; physical, human and organisational.

³⁶ Those skilled in the theory field of innovation system research would say that I make myself guilty of deficient logic within this figure. I am however well aware of the fact that support programmes are inherent parts of the IS. Nevertheless, to emphasise the aim of public support I have in the figure lifted it out.

5.1.2 Goals and targets of support programmes

Although policy measures, such as different support programmes are usually formed on a national level, their design and objectives are influenced and affected by policy development in a wider context. Since 1995, Sweden has been part of the European Community, which implies that national policy objectives are influenced by the policy objectives at a federal level. As an example of this, the citations below, which illustrate how federal level goals have been changed into national level goals in the Swedish version, could be mentioned.

“The Lisbon European Council of March 2000 set the objective of making Europe the most competitive and dynamic knowledge-based economy in the world” (COM, 2005, p 2).

“Sweden shall be the most competitive and dynamic knowledge-based economy in Europe ...” (Ds, 2004:36, p 1)³⁷.

Besides the policy objectives that are formulated on different levels, the programmes are also affected by their stakeholders. As examples of stakeholders could be mentioned the organisations that govern the programmes, the actors that have interests in the programmes, and the actors that in other ways influence (e.g. by lobbying) the goals of the programmes. With regard to the SIC programme, actors such as STU³⁸ and Nutek as well as the actors that represented the demand side, e.g. the various associations of inventors and small firms, were active before, and at the start. For the Vinn Nu programme, the governmental agencies Vinnova and Nutek were the main interested parties at the beginning. During more recent years however, Vinnova have shared the governance of the Vinn Nu programme with another governmental agency, Energimyndigheten³⁹.

With regard to the different incubator programmes, the picture is more diverse. Commonly, the nearby university, the municipality and sometimes the nearby science/technology park (if there is any) are the main stakeholders. However, there can be other constellations as well. The incubator Iqube⁴⁰ could be mentioned as an example; it is privately owned and run as a profit driven enterprise. It is likely that the interested actors listed have influenced “their” respective programmes in different directions.

³⁷ My translation of “Sverige ska vara Europas mest konkurrenskraftiga, dynamiska och kunskapsbaserade ekonomi” (Ds, 2004:36, p 1)

³⁸ Styrelsen för Teknisk Utveckling (National Swedish Board for Technical Development) was a governmental agency during 1968 to 1991. In 1991 the activities of STU was transferred to the newly incepted governmental agency NUTEK (Larsson, 2006).

³⁹ Swedish Energy Agency

⁴⁰ www.iqube.se (2007-12-27)

As Storey (2000) has argued, a situation with different stakeholders representing different views of what will be the most desired or expected outcome implies a high risk of blurred or diverging goals, or worse, stakeholder goals that stand in a direct conflict with each other. Since such situations are undesirable, Storey (2000) regards specified goals as a prerequisite for evaluation, and argues that governments “should be required” (p. 179) to specify their goals in their provision of venture support. Furthermore, if the goals are blurred, there is an immediate risk that the entire programme theory becomes unclear, since clearly specified programme goals are regarded as a prerequisite for a coherent programme theory (Hoogerwerf, 1990).

As shown in Table 3, no measurable targets are stated for the SIC programme. I have not explicitly asked why this is so, however, based on information from initiated individuals and from written sources such as Larsson (2006), I have drawn the conclusion that the consensus among the interested parties has not always have been strong. This might be an explanation as to why the SIC goals are wide. Another explanation could be that measurable targets were not emphasised as important at this time, and therefore this issue was overlooked.

Goals and targets of SIC	Goals and targets of Vinn Nu
<ul style="list-style-type: none"> • Create a better innovation climate in Sweden and make people’s attitudes to innovators positive. (not investigated) • Facilitate the development of innovators concepts into commercialized products or services • Support innovators in earliest phases of development – with financial capital, advice and networks. • (No specified measurable targets found) 	<ul style="list-style-type: none"> • Facilitate the preparation of- and shed light upon early, commercially interesting development projects. • Develop and increase the ability of the supported firms to attract follow on investments, so that they can grow into successful Swedish enterprises. • 50% of the supported firms shall have attracted external finance (i.e. VC) after two years. • 20% of the firms shall survive and grow after 5 years

Table 3, Example of high-level goals and targets of two public support programmes

As shown by the table, the programme goals can be divided into high-level goals and operational goals, with the high-level goals stating the direction of the programme. However, these are generally of an abstract nature and therefore difficult to measure. Thus, to be able to undertake any follow-up and evaluation of the programme, the abstract high-level goals have to be broken down, preferably into SMART⁴¹ targets or indicators that can be measured and evaluated (cf. Storey, 2004). The Goals of the SIC programme (Table 3), could be used as example of abstract goals that are complicated to measure. For the Vinn Nu-programme, the abstract goals have been broken down into measurable targets (e.g. “50% of the supported firms shall have...”).

⁴¹ SMART targets are Specific, Measurable, Attainable, Realistic and Timely

5.1.3 Summary on RQ 1

How can public programmes to support TBVs be justified, and what are their goals?

The rationales of public interventions, have been divided into two main types; rationales based on societal desires and rationales based on the barriers that due to venture characteristics, are faced by the targeted ventures. With regard to the first, prospects of societal growth, innovativeness and job creation can all be mentioned. The latter type is generally connected to different types of inabilities coupled both to the venture itself and to the market. Not all attempts to commercialise ideas can be successful, but barriers, which are too large might lead to prevention of societal growth and development.

The conclusion reached in this thesis is that a broad perspective on venture development is needed, one in which ventures are regarded as part of a larger context – an innovation system (IS). To reach sustainability, ventures need to be able to obtain crucial resources from the external resource base (the IS) and to be able to utilise these efficiently. Regarded from these theoretical perspectives, aiding the linking process, between ventures and their relevant IS, becomes the main task of public support programmes directed to TBVs. Public support is thus proposed as a complement to the market, i.e. to have as its purpose to bridge important resource gaps, and thereby enable the supported ventures to gradually, as they mature, act in accordance with the conditions of the market.

The goals of national policy interventions are affected by the policy goals at international levels. Besides these, the stakeholders of the programmes affect the programme goals. Stakeholders representing diverging views of what to achieve may create blurred or diverging goals. This is undesirable, as such situations may hazard the entire programme theory, and thereby create inconsistencies that affect the efficiency of the programme. Furthermore, to enable follow-up, high-level programme goals must be broken down into measurable targets or indicators.

5.2 What are the parts and components that constitute public support programmes to support TBVs?

Public support programmes consist of three main parts, and these can be described conceptually as shown by Figure 1. The three main parts are (1) the goal(s) of the programme, (2) the treatment given by the programme, i.e. its business support model, and (3) the outcome or the result of the programme. In the text below, I will analyse the second box, the support model and its components. The first box, the goals and rationales of public support programmes have already been analysed above. The last box, the outcomes, will be dealt with below under the research questions 3a and 3b.

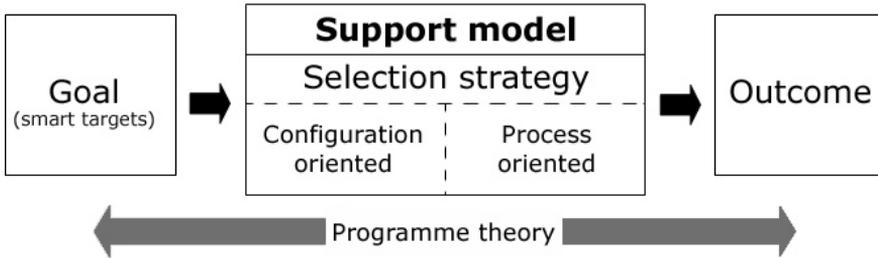


Figure 1, The parts and components of a public entrepreneurship support programme.

5.2.1 The support model components

The support given by the various support programmes differs according to their individual goals and programme theories. One main distinguishing factor, however, is the orientation of the programme, i.e. if the programme is process-oriented or if it is configuration-oriented (Autio & Klofsten, 1998).

In paper 1, a conceptual model for the incubator support was developed. This support model is based on three main distinguishing components, selection, business support and network mediation. The first, selection, refers to the process by which the incubator tenants are selected into the incubator. The selection process is common to all the programmes studied and will be further discussed under RQ2b. The second component, business support, refers to the support given to the tenants in order for them to develop them into fledging firms. For the incubators we found that the business support given ranged between what was labelled as “strong intervention” and “laissez faire”, i.e. minimal intervention. In practice, the support can be described as consisting of various coaching- and training programmes, through which the entrepreneurs get help (and are push) to develop and refine their business ideas. The third component, network mediation, refers to the incubators’ role as mediator between the tenant ventures and the surrounding innovation system. Examples of mediation activities could be seminars, focus groups, and participation in trade fairs, but also individual pinpointing of contacts, such as the arrangement of meetings with prospective investors and property owners.

In the following, I will start out from the model described above, which was developed in paper 1, and extend it in order to fit the context of public support programmes in general. To do so, I will follow the advice of Bearse (1998) and let the data show the way. Table 4 shows the main support model components for each of the programmes of SIC and Vinn Nu.

Support model of SIC	Support model of Vinn Nu
<ul style="list-style-type: none"> • Finance in case of conditional loans (maximum 44 M€) and innovation subsidies (maximum 4M€), (scholarships for special occasions). This money was to be used to cover external costs (not own salaries) of a list of specified using areas. • Advice provided by external advisors • Measures to facilitate networking 	<ul style="list-style-type: none"> • One single financial subsidy of 33 M€ whereof 50% has to be spent on marketing measures. 25% can be used to cover own salaries. • Formally, the Vinn Nu programme gives no additional support such as advice or networking activities. However, there are informal contacts, such as information circulars and follow-up activities to the supported firms.

Table 4, Examples of support models of public support programmes

Starting with the SIC programme, the main business support components listed are finance, advice and network. Using the same categorisation as for the incubators implies that the three main distinguishing components are business support in the form of finance, business support in the form of advice, and network mediation. For the Vinn Nu programme, business support in case of finance is the only formal support component. From these observations it can be concluded that the SIC programme support model is larger than that of the Vinn Nu programme, as it comprises more components and includes both configuration-oriented and process-oriented components. Besides these components, both programmes apply a selection process.

5.2.2 Summary on RQ 2a

What are the parts and components that constitute public support programmes to support TBVs?

From the above, it can be concluded that a conceptual support model developed to fit a generic context consists of the following components; selection, configuration-oriented support and process-oriented support.

Because the selection process is common to all the support actors studied, irrespective what type of support is given, it has been given its own square in the model described by Figure 1. The remaining support model components are programme-specific, and thereby differ, in presence as well as in extent, between individual programmes, and hence cannot be specified in a generic conceptual model. This implies that the model components within the generic model have been left as process-oriented (e.g. business advice, training and network mediation) and configuration-oriented (e.g. finance and infrastructure). Since most programmes, at least to some extent, give a mixture of configuration- and process-oriented support, these business support types are separated by broken lines. The conceptual model of public support programmes (Figure 1) can be used as a tool for systematic mapping and detection of crucial and distinguishing components of one or several support programmes that are to be studied.

5.3 How, and on what grounds are TBVs selected for support?

Above, it is concluded that a selection process, where ventures that are to be supported are separated from those that are not to be supported, is generic for all the support programmes studied. It is also shown, by the papers and within the sample characteristics, that the selection is carried out due to specified selection criteria, such as those exemplified within the below Table 5.

Below, I will first analyse the selection of each programme studied, starting with the incubators. Then I will make some general conclusions of different selection strategies among public support actors. This will be done by applying the theoretical model for selection that was developed in paper 1. Finally, I will discuss some components that might affect selection in a general sense.

5.3.1 The incubator selection process

From the empirical part of paper 1, where the Swedish incubators are analysed, it is shown that the selection conducted by the incubators varies. In some cases, it appears to be very careful, well structured, and follows diligently prepared step-wise routines, in order to sort out the most promising tenants. In other cases, the selection seems to be shallower and to aim rather at giving those that really go for it a chance. The final selection decision, in such cases is consciously left to the market. According to paper 1, the selection strategy chosen depends on the goal(s) of the selecting incubator. This is in line with what has been labelled as the “programme theory” in the above Figure 1 (see also section 2.6).

The incubator selection process in paper 1 is conceptualised into a four-field matrix⁴² of incubator selection strategies. The matrix (Figure 5), illustrate four different selection strategies that can be used by policy programmes to select which ventures to support.

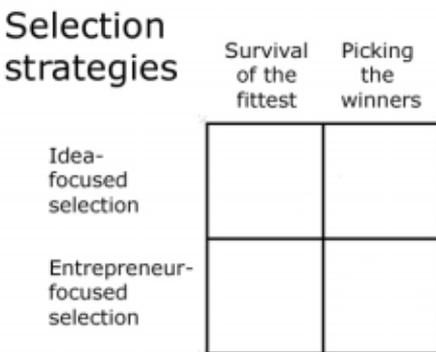


Figure 5, Selection strategies

⁴² For details, see also paper one.

The identified selection strategies result in diverging incubatee portfolios, which could be described as follows:

- *Survival-of-the-fittest & idea*: The portfolio will presumably consist of quite a large number of idea owners (or prospective entrepreneurs) with immature ideas related to a broad spectrum of fields.
- *Survival-of-the-fittest & entrepreneur*: The resulting portfolio will be diversified, and consist of entrepreneurs/teams with strong driving forces representing a broad set of ventures.
- *Picking-the-winners & idea*: Results in a highly niched portfolio of thoroughly screened ideas within a quite narrow technological area – often derived from the research of highly ranked universities.
- *Picking-the-winners & entrepreneur*: The portfolio consists of a few handpicked and carefully evaluated entrepreneurs, commonly with ideas coupled to the research areas of a nearby university.

For the incubators, all the four strategies seen in Figure 5 may be used. Which one is applied depends on the goal(s) of the individual incubator studied. In paper 1, we found that most (but not all) of the Swedish incubators studied aimed at picking winners rather than giving the chance to a larger number of ventures and then let the market decide what ventures are to survive. However, it is rather common that incubators, especially those coupled to the universities, use some kind of in-step process or pre-incubation process (also labelled *idea-hatchers*). These initiatives focus on the idea stages of presumptive ventures. They aim broadly, in order to stimulate entrepreneurship and to help students and researchers to qualify their ideas enough to take next step (e.g. into the business incubator). This focus on idea qualification implies that the *idea-hatchers* generally use a *survival-of-the-fittest* approach. For example, actors such as the *VentureZone* at Linköping University and the *Idé Lab* at Mälardalen University (Västerås/Eskilstuna), can be mentioned.⁴³

⁴³ See also <http://www.venturezone.se> and <http://www.mdh.se/idelab/> for more information

5.3.2 The Selection of the SIC programme and the Vinn Nu programme

The selection criteria of the SIC programme and the Vinn Nu programme are presented in the below Table 5.

Selection criteria of SIC	Selection criteria of Vinn Nu
<ul style="list-style-type: none"> • Selection criteria: (1) new ideas/projects, (2) ideas/projects able to be commercialised and, (3) ideas/projects technically or intellectually advanced. • All types of liabilities, including sole proprietors and private persons, were accepted. • Broad aiming strategy, supporting practical consumer products as well as advanced techniques for industrial and societal purposes • Selection strategies and areas of use were specified in the application 	<ul style="list-style-type: none"> • Selection criteria: (1) relevance (i.e. certain industries, R&D based ideas and prospective growth firms preferred), (2) quality, (3) feasibility of realisation (4) exploitable. • Limited companies only • Narrow focus on a specified target group • Selection strategies and areas of use specified in the application

Table 5, Examples of selection criteria of public support programmes

The selection process of the SIC programme, was described as swift and uncomplicated (SIC), and as shown in paper 5, the process was fast. The explicit selection criteria were that the idea had to be new, able to be commercialised and, technically or intellectually advanced. The average support rate was rather high since 57% of the ideas applying gained support.

However, as demonstrated in papers 2, 3, and 4, the ventures that were selected for support had some common characteristics. The first is legal form. The presence of a limited company, is shown in the statistical analysis of paper 2, 3 and 4 to be important for gaining support in general. The variable “legal form” is also strongly correlated to the amounts gained. Additionally, there were some differences which concerned legal form due to gender (papers 2 and 3) in the case of the conditional loans, as more males than females applied for conditional loans as limited companies. Almost two thirds of the females applied as sole proprietors, compared to 40% of the males. However, when the variable legal form was also included in the analysis, it emerged that females with limited companies were the most successful group in gaining support. Other than the facts mentioned above, there were no significant differences in support rates between males and females in general. Moreover, the gender differences observed can be explained as being mostly of a structural character (Norrman, 2004).

The second characteristic is industrial sector; all three papers (2, 3 and 4) show that certain industrial sectors were correlated to support. This holds both for the loans and for the innovation subsidies, i.e. knowledge intensive industries attract higher amounts of financial support than industries categorized as less knowledge intensive. Additionally, paper 4 gives evidence that education intensity is coupled to high support rates. Finally, papers 2 and 3 indicate that both expressed and tacit selection criteria have affected the process that determines what ideas gain support in form of conditional loans.

Paper 5 generated interesting findings with regard to selection. In this study, the firms supported by the SIC programme were divided into two groups, those that applied and were supported once, and those that applied and were supported on multiple occasions. According to the findings from our interviews, the latter group was regarded as being of higher potential. However, when the performance of the single-time supported and the multiple-time supported ventures were compared, it was shown that the single-time supported firms outperformed the multiple-times supported ones. This result, as well as why certain factors correlates to support, will be discussed and explained below.

Applying the selection strategy matrix (Figure 5) above described on the SIC programme, shows that the strategy labelled, “idea-focus-survival of the fittest”, seems to represent the main selection strategy of the SIC programme. This is because the programme aimed broadly in order to promote the development of innovative ideas and projects (SIC, 2002).⁴⁴

The Vinn Nu programme, unlike the SIC programme, specializes in a rather small segment, since it targets new and preferably research-based firms. The finance is given in order to prepare and develop the selected firms so that they can attract follow-on investments from other financiers.

The selection of firms for Vinn Nu can be described as rather rigorous, each application is read by 4-6 people from the organisations that own the programme (Vinnova & Energimyndigheten, 2006, and paper 7). After this, a preliminary list, twice as long as the number of firms that will be selected is prepared, and after this, an interview process follows, where the number of firms invited is larger than the number of firms to be selected. From our statistics, we can conclude that between 5 and 15% of the applying ventures have been supported each year. We have not analysed the applications that were rejected by the Vinn Nu programme.

Applying the selection matrix (Figure 5) on the Vinn Nu programme, shows that the areas “idea- or entrepreneur-focused-picking the winners-strategy”, seem to represent the main selection strategies. A picking-the-winners approach seems to have been chosen since their aim is to identify and support prospective gazelle⁴⁵ firms that have the potential to attract venture capitalists. This selection strategy is similar to the strategy of most venture capitalists, as these actors strive to make profitable investments (Bygrave & Timmons, 1992). However, venture capitalists are even more rigorous into their selection, which is generally characterized by careful and costly due diligence procedures (Zacharakis & Meyer, 2000; Baum & Silverman, 2004, and paper 5). For private investors, it is also shown that the abilities of the entrepreneur(s) is of high importance, especially for the selection by business angels (Mason & Stark, 2004).

⁴⁴ Paper 5 shows that the SIC programme also made efforts to pick winners by encouraging ventures that were judged as having potential to re-apply for additional funding. According to the findings of the paper, this approach was not successful.

⁴⁵ Fast growing firms

Common to both the SIC programme and the Vinn Nu programme is that selection criteria and prerequisites for application, along with how and to what activities the money can be used, are/were carefully specified within the application form/call for application respectively. For both programmes, the prerequisites for application can act as discouragers, as they explicitly state which type of ventures are welcome to apply, and which are not. In the case of the Vinn Nu programme (see paper 7), the lists are even more comprehensive, both in terms of the number of conditions and the degree of restriction. The conclusion from this is that the application form, as such, is one part of the selection process.

Taken together, this shows that the matrix in paper 1 (Figure 5) can also be used to identify the selection strategies in the broader context of RQ2b. In this context, the matrix can explain or rather identify the selection strategies of different support actors or resource providers. This information is useful when the differences between various types of support actors are to be identified.

5.3.3 Additional factors affecting selection; ability to communicate the idea

The above findings from the SIC programme indicate that certain factors, explicit or tacit, but outside the stated selection criteria, are linked to the decisions to give support. In the following, I will discuss and suggest some explanations for these findings. I will start with the findings in paper 5, (i.e. the single-time supported firms outperformed the multiple-times supported firms) and then continue with the factors connected to the decisions of support.

To explain the findings, referred to above, in paper 5, the classification of concreteness and degree of market anchoring proposed by Klofsten (2005) could be used. According to this classification, the first group, the single-time supported firms, represent the category labelled concrete (i.e. the idea is concrete if the venture holds a developed product that is based on a market need - the idea is understood by the market), which are rather easy to communicate to the market.

The second group, the multiple-times supported firms, belongs to the category of innovative ideas that are more difficult to communicate (i.e. ideas that are not understood, and/or need several years of further product development). Such ideas can be exemplified by inventions or ideas that originate from research within new areas, which is often the case of innovative new-technology based ventures. The type where the potential is the largest is in cases where the market pull is strong, e.g. such as a working H5N1 bird-flu vaccine. A venture that solves this problem, and has protected the solution, can most probably experience rapid growth. Despite this potential, the multiple-times supported firms, as group, were outperformed.

A reasonable explanation, as to why the group of multiple-time supported firms was outperformed, is that in cases where the market pull is strong, it is also likely to assume that several ventures try to solve the problem, as success

will generate large profits. However, all of them might not be winners, and picking prospective gazelles at an early stage is not easy, since the information available is limited (cf. Storey & Tether, 1998b; Lindholm-Dahlstrand & Cetindamar, 2000; Zacharakis & Meyer, 2000). Lack of ability to present the idea or the business concept to other follow-on investors is an other reason for failure put forward (Mason & Harrison, 2001; 2004). The time factor might also be an explanation, since the 3-8 year time-span that was investigated in paper 5 may be too short. Innovative ideas in particular, require time to develop.

Taken together, lack of information, and/or of ability to present the idea leads to information asymmetry, which in chapter 2, is referred to as a reason for why ventures fail to obtain finance. Hence this (or the opposite – a clear and informative presentation based on facts) probably acts as a tacit selection criterion affecting the decision of support.

5.3.4 Additional factors affecting selection; Credibility

From the studies of the SIC programme, it is shown that certain variables (legal form, industry and knowledge intensity) were correlated to support, and it was indicated that also tacit or soft aspects probably affected the selection of ideas for support as well. A uniting denominator of these findings is the credibility factor.

It is suggested that credibility plays a key role in gaining the resources that are regarded as vital for TBVs (Birley & Norburn, 1985; Storey & Tether, 1998a; Klofsten & Lindholm-Dahlstrand, 2000; Zimmerman & Zeitz, 2002). Klofsten et al (1999) argue that “young firms often fail because they simply have not achieved credibility” (p. 90). Zimmerman and Zeitz (2002) highlight the importance of earning credibility, or legitimacy, as they put it, at an early stage. Legitimacy provides to Zimmerman and Zeitz (2002) “a means to overcome the “liability of newness”⁴⁶ (p. 414), a state that is referred to as contributing highly to new ventures failing. The risk of being stuck in what Birely and Norburn (1985) refer to as “the credibility Merry-Go-Round” (p. 84) is impending if the circle cannot be broken, at least at one point. For the young firm, personal credibility is viewed as the only way to break this circle.

The findings referred to above can be connected to the matter of credibility in the following ways: First, the legal form of the firm; having stronger liabilities, such as being a limited company, is shown to increase credibility (cf. Storey, 1994; Harhoff & Stahl, 1998). Hence, a limited company gives trustworthiness and makes it more attractive to support the application. Second, different types of industries seem to “have more or less legitimacy that can be conferred upon the firms operating within them” (Van de Ven,

⁴⁶ Liability of newness is by Stinchcombe (1965) explained as the way new organisations differ from established. As example new organisations have got a higher failure rate than established. They have to invent new roles and they have to rely on relations with strangers in a larger extent than established organisations. Taken together this increases the vulnerability of this type of ventures.

1993, p 420). In paper 4, we found that the industries that showed the strongest correlation to support were recognised as growth industries also in other studies. It is then likely that the administrative officials, at least partly, were affected by generic attitudes about which industries are coupled to growth and which are not. This assumption was however not tested. Additionally, knowledge intensity, which may be interpreted as the experience and education of the entrepreneur and/or valuations of innovativeness and future orientation of the industry in which the firm operates, is viewed as an important source of credibility (Van de Ven, 1993). Finally, soft aspects such as the personal impression transferred by the applicant may also have affected the decision to support or reject. This is what is referred above to as personal credibility.

5.3.5 Summary on RQ 2b

How, and on what grounds are TBVs selected for support?

First, it can be concluded that the matrix of selection strategies developed in paper 1, is also applicable as a theoretical model to describe the selection of support programmes in a larger context than that of incubators. According to this matrix, programmes select tenants due to the following four strategies: (1) idea focused survival-of-the-fittest, (2) entrepreneur focused survival-of-the-fittest, (3) idea focused picking-the-winners, and (4) entrepreneur focused picking-the-winners. These strategies result in different portfolios, and to keep a consistent programme theory, the strategy chosen ought to be related to the goals of the support programme.

The findings of this thesis show that incubators can use all four strategies; but that the picking-the-winners strategy was the most common. However, in-step programmes – so called “idea hatchers” use the opposite strategy. The SIC programme used an idea focused survival-of-the-fittest strategy, while the Vinn Nu programme selects from a picking-the-winners strategy. To summarise, applying the selection strategy matrix on the two programmes investigated shows that the matrix can be used as tool to discriminate between programmes based on their selection of ventures for support. Furthermore, paper 1 shows that the selection of firms for support ought to be connected to the goals of the support actor, hence identification of the selection strategy can be a way of differentiating support actions in cases where explicit goals are vague or non-existent. It can also be a tool to detect inconsistencies within the programme theory. For example, in cases where the goals differ from the selection strategy of the support activity (although the SIC programme aimed broadly and selected broadly, there were also efforts to pick winners, see paper 5).

The appended papers show that factors such as legal form, industry, intensity of knowledge and other soft aspects have affected selection. These results can be understood through two uniting factors: (1) the venture’s ability to communicate its idea, and (2) the credibility of the venture. With regards to

the first, it is shown that abstract ideas are more complicated to communicate than ideas that are more concrete. The ideas of innovative ventures are often abstract, and can hence be problematic to evaluate. Lack of investment readiness, due to the venture's inability to present the offer is another problem. Taken together, this can occur information asymmetry, which is a commonly referred reason why firms fail to convince external actors such as financiers and customers.

The second factor, the credibility of the venture, also affects the ventures ability to gain support. For new ventures with no record of accomplishment, the credibility is coupled to their entrepreneur(s). This study shows that credibility can also be coupled to legal form, type of industry and to knowledge intensity.

5.4 What outcomes can be expected from public programmes to support TBVs, and how can it be evaluated?

This research question consists of two parts. The first deals with what outcomes could be expected to be generated from a public TBV support programme. The second part concerns the issues of how, and based on what prerequisites the outcome of public support programmes could be evaluated. Finally, both parts will be summarised.

5.4.1 Analysis of what could be expected as outcome of public support programmes

Outcome is more than statistics over the number of jobs created and average turnover. It is also about the factors that could be expected to emanate from a public investment into private venturing. Above, it is proposed that the main task of public support is to help the TBVs to link to the IS. It has also been hypothesised that this linking process could be enhanced by factors such as (1) increased investment readiness, (2) credibility spill over from the support programme to the supported venture, (3) network mediation and (4) increase in entrepreneurial motivation. These factors were suggested as being the desired or expected outcomes of public support actions in Norrman (2005). To find out more about the outcomes of public support, this was investigated in the papers 6 and 7.

For the first factor, investment readiness, the following findings were made: for the SIC programme, our findings supported the hypothesis, but only weakly (see paper 6). However, for one of the measures, the development of the product idea, the result was clear-cut, as there was general agreement among the respondents that the money supplied by the SIC programme had played a substantial role for the development of their products. As far as the market aspects are concerned though, the evidence of any development was quite small. This also holds for the Vinn Nu supported ventures, as they admit that their product ideas were developed through the money that was granted (paper 7). Furthermore, we have seen that the firms in mean have developed positively in a number of ways that have an important effect on the gaining of

external investments. Additionally, after 2-3 years, about 60% of the supported firms have attracted external owners.

From the analysis of the SIC data, we have noted that the SIC programme used a system of repeated applications. The average number of applications for innovation subsidies has been 1.4 applications per individual project. This means that the entrepreneur had to prepare repeated applications where the idea was presented over again, especially in cases that were started with innovation subsidies and were continued with loans. Such repeated applications ought to imply both practice and awareness of external funding at an early stage. Both these factors are seen in other studies as useful attributes if the venture is to gain external investments (Maigart and Struyf, 1997; Mason and Harrison, 2001). With regard to this process, one would have expected higher scores on the measure "business development". One explanation for the result might be the strong focus on product related measures, which is shown both by the result on this measure and by the allocation of money, i.e. that two thirds of the funding was put into development and protection of products.

With regard to credibility spill over, the following findings were made: For the SIC programme (paper 6) we found no support for the hypothesis that the support increased the credibility of the supported ventures, either to customers, or to financiers. Hence, as the mean values were close to zero or negative, the hypothesis was rejected. This result is in contradiction to the previous findings of e.g. Klofsten et al. (1999) that showed that being selected and granted public finance, even if it was only modest or small sums, implied increased credibility of the supported firm in the eyes of external actors such as financiers.

In the case of the firms supported by the Vinn Nu programme on the other hand, the latest findings (from the 3-year follow up of 60 firms) indicate (with regard to credibility to financiers), that public support is able to spill credibility over the receiving ventures. For credibility to customers, on the other hand, the indications are the opposite. However, it must be underlined that the figures are rather weak, as the means of these measures are slightly above/below zero (0.45 for giving credibility towards financiers and -0.26 towards customers). From the interviews conducted and from the open ended questions, on the other hand, the picture is more positive, as the Vinn Nu award is regarded as being an important proof of quality and thereby increases the venture's credibility to other sources of finance.

These findings indicate that there can be a correlation between credibility in the eyes of financiers and support from a public programme. If so, the ability to spill over credibility is connected to the matter of selection, i.e. that programmes that makes rigorous selections spill credibility over their supported ventures to a larger degree than those whose selection are less diligent. This probably also means that credibility spill over cannot be expected from support given in the absolute earliest stages of venture development. However, as the support, for our hypothesis at least from the questionnaires is rather weak, this has to be investigated further.

The ability to enhance the networking of supported ventures was investigated (in paper 6) for the ventures that were supported by the SIC programme. No evidence of corroboration of this hypothesis was found. Because networking was emphasised as one out of three main tasks of the SIC programmes, higher scores for this measure were expected. For the Vinn Nu programme, networking, formally regarded, is outside the scope of the programme.

Whether public support plays a role in increasing the motivation of the supported ventures was investigated both for the SIC programme (paper 6) and the Vinn Nu programme (paper 7). For both programmes, the findings show support for the hypothesis. Hence, the role of public support as a way to increase entrepreneurial motivation seems important. These findings support the findings of Klofsten et al. (1999) that indicated that small sums of public support could increase the motivation of the supported ventures. Motivation or driving forces are regarded as a prerequisite for success (Klofsten, 1992). It is argued that entrepreneurs are driven by intrinsic (such as ownership, control, responsibility and psychological rewards) and extrinsic (tangible rewards such as finance) motivation factors (Naffziger et al., 1994; Choo & Wong, 2006). According to this division, public support in terms of finance to promising ideas can be labelled as an extrinsic motivation factor for the ventures that have gained support. By gaining support for an application, the entrepreneur gets confirmation (reward) to continue his or her struggle.

5.4.2 Outcome evaluation

The result or outcome of public support programmes is a matter that is connected to the evaluation of programmes. Although much research effort has gone into the development of outcome indicators (see paper 1), it must be kept in mind that the outcome as such, is no indicator of performance or effectiveness, unless it is coupled to the goal(s) of the programme (Vedung, 1998; Mosselman et al., 2004). This is because different outcome indicators correspond to different goals e.g. the goal of job creation corresponds to the indicator of the number of jobs created (paper 1).

To illustrate this, I will apply the model described in Figure 1 of the support programmes of SIC and Vinn Nu.⁴⁷ Above, I have given examples of how programme goals could be formulated (see Table 3). I have also shown the business support model components (see Table 4 and 5). To complete the picture, Table 6 exemplifies outcomes from the SIC- and Vinn Nu programmes.

⁴⁷ The model has also been applied in the context of incubator support which is presented in the paper 1.

Outcomes of the SIC programme	Outcomes of the Vinn Nu programme
<ul style="list-style-type: none"> • 50 % have commercialised to some extent in some way (n=152) and 37% have commercialised successfully enough to start to pay the loan back (n=154). • 12.3 % has got external owners (n=154). • 1.15 employees in mean after 2-3 years (n=129, st. dev =2.23). • 38% has increased the turnover since they were supported. (n=154) 	<ul style="list-style-type: none"> • 53% have 2-3 years after the support sent an invoice during the latest month. • 60% of the firms (n=58) have after 2-3 years got external owners. • 56% have more than 3 employees after 2-3 years, in mean 4.5 (n=60, st. dev=8.2) • 55% have increased the turnover since they were supported. 2/3 are still developing after 5 years.

Table 6, Examples of outcomes of public support programmes

When the programmes of SIC and Vinn Nu are regarded from a model (Figure 1) perspective, three important points arise. The first one is the importance of measurable targets, the second is what prerequisites that are needed for comparison, and the third is that, through applying this model, it is shown that the programmes compared are different.

With regard to the first point, the importance of measurable targets (see Table 3): For the case of the Vinn Nu programme, it is possible from the result shown in Table 6 to argue that the programme has been successful in fulfilling its targets, as both of the stated targets⁴⁸ are in fact fulfilled. From the outcomes of the SIC programme, however, it is more difficult to draw any conclusions concerning the success of the programme. The reason for this is the absence of measurable goals, which also is mentioned to be problematic in paper 5.

It can be stated that the SIC programme supported innovators and early stages ventures. We can also see that to some extent, the supported innovators have commercialized their ideas, and some of those supported have been successful enough to start paying back the loan. Irrespective of numbers and scores, do these results indicate a successful programme? Are the figures good, bad or expected? Would it, for example, have been enough if only two ventures had commercialized their ideas, since two commercialized ideas still implies that SIC have helped innovators to commercialize *their* ideas?

According to Mosselman et al. (2004), performance is a matter of doing the right things, and efficiency a matter of also doing them well. This implies that there must be an alignment between what is expected (the goals) and what is done (the support model). This alignment has been interpreted (in chapter 2, section 2.6 on page 27) as a consistent programme theory. In Figure 1, this alignment is marked by the grey arrows. Hoogerwerf (1990) and Storey (2000) argue that evaluation gets complicated if the support programme lacks programme theory and clearly stated goals. The above example supports this argumentation, since it illustrates that evaluation, in the case of goal attainment, becomes complicated without measurable goals and targets.

⁴⁸ Vinn Nu targets from Table 3: 50% of the supported firms shall have attracted external finance (i.e. VC) after two years. 20% of the firms shall survive and grow after 5 years

In order to estimate the impact (treatment effect) of support programmes, it is important to be able to tell whether a certain result is result of the support provided by the programme or if it is the result of other factors, such as the selection process. To do this, investigations such as the papers 6 and 7 are not enough, as they only survey supported firms. Rigorous evaluations require a control group approach, where the performance of the supported ventures is compared to similar firms who have not undergone treatment (Storey, 2000). Such types of evaluations can also be undertaken when measurable targets are missing. This was done in paper 5, and instead of measurable targets, we measured additionality against hypotheses that were drawn from theory. However, it must be kept in mind that such a hypothesis is built upon a qualified guessing of the intentions, which implies that important aspects can be overlooked as it makes it difficult to connect outcomes with intentions.

The matter of setting up good control groups requires a lot of thought, since it generally implies that bias, of one or another type, has to be dealt with in order to get a reliable result. In paper 5, we used rejected ventures and the reason for this was to avoid self selection bias (i.e. that there might be a difference between firms that have applied for support and those that have not). Instead, we got an administrative selection bias (i.e. the programme administrators select the most prosperous firms and avoid those of low quality). To remedy this bias, we used a match sample approach, and compared cases that were as similar as possible in the treated and untreated groups respectively.

With regard to the second point, the prerequisites for comparison of different programmes, the above tables display facts about the two public support programmes. Is it possible from this to compare the programmes and tell which one is the best/most efficient? There are two answers to this question; “yes, to some extent” and “no”. With regard to the “yes, to some extent”, it is of course possible to compare the merits of different types of programs in a general sense. However, it is not enough to solely regard the outcome. Instead, as argued in paper 1, it is important to also consider the goals and targets of the programmes, how and what support is given, to whom and due to what prerequisites, i.e. attention must be paid to the third of the above points – the differences according to goals and support models. Then, investigations of whether certain models are more effective than others to leverage certain types of outcome can be undertaken.

The reason for the answer “no” is also linked to the third point stated above. The programmes give similar types of support, i.e. soft money to early stage ventures. However, there are large differences as well. First, the target groups differ. The Vinn Nu programme is specialized and has a narrow focus on R&D based limited firms while the SIC programme aimed broadly to support innovation at a more general basis. Second, the support model differs. The Vinn Nu support is given after a thorough selection process aimed at picking the best cases in terms of growth potential, while SIC followed a strategy which aimed broadly. The SIC support was given to private persons as well as to firms. Additionally, it was given to innovative ideas in a general sense, not

only to those that were R&D based. Third, the actual support given differs; The Vinn Nu programme only supplies finance in the form of a grant at one single occasion, while the SIC programme gave finance in the form of grants and loans and, in addition to that, also supplied advice and network mediation. The SIC programme were also open to multiple applications. Taken together, this implies that there are differences between the programmes regarding the goals as well as the support model, including the ventures targeted. Thus, as is argued in paper 1, the outcome of the two programmes cannot be compared under the same conditions.

To summarise, evaluation can be undertaken in several ways (cf. Storey, 2000). It seems that there is no single best way to go, as different approaches have their different merits. Instead, a combination of methods are usually required to give a holistic picture of the programme investigated (Lengrand, 2006). This is also the principle that has been followed in the work of this thesis. Several techniques have been used; quantitative analysis of programme specific data (paper 2, 3 and 4), quantitative analysis of survey based data (paper 6 and 7), quantitative analysis of programme specific data in combination with accounting data using a matched cases approach (paper 5), and analysis based on literature (paper 1). Furthermore, the quantitative analysis has also been complemented with qualitative elements in the form of interviews with firms and programme officials.

5.4.3 New methods for evaluation

In a recent government report (Regeringskansliet, 2006) it is argued that the overall aim of evaluation is to contribute to learning. According to the same report, one way of fulfilling this aim is by the use of new evaluation methods. In the work to evaluate the Vinn Nu programme, a new methodological approach has been tested, to complement the questions about basic facts and attitudes. Based on the business platform theory (Klofsten, 1992)⁴⁹, scales developed by Davidsson and Klofsten (2003) have been used in order to measure the degree to which the supported ventures have developed their business maturity since they were supported. The original scales were designed to measure the change in development between two points of measurements. However, in the Vinn Nu study, the firms are followed up on three occasions (initially, after three years and after 5 years) which implies that the method has been developed further. This investigation is still ongoing, and the number of observations is thereby low (because of the short time that has passed). It is hence too early to tell whether the method used really works the way we hope. However, the previous study by Davidsson and Klofsten (2003), which was made on a larger sample, indicates that the scales are both valid and reliable.

Through this method, we hope to learn more about early stage development processes. Our expectation is that this method will not only show how the ventures develop, but also give indications about which areas in the venture development process additional measures might be needed. This ought to be possible as the scales are detailed, see paper 7.

⁴⁹ See also note 6

5.4.4 Summary of RQ 3a

What outcomes can be expected from public programmes to support TBVs, and how can it be evaluated?

With regard to the first part of this research question, and based both on our previous findings and on theory, it was hypothesised in papers 6 and 7 (to some extent) that public support programmes directed to TBVs ought to result in increased investment readiness, credibility spill over, facilitation of networking and increased motivation. Weak indications of investment readiness were found. However the support, both from the SIC and the Vinn Nu programmes, helped improve the product ideas. Hence, there is room for improvement in the area of business development. It is probable that measures other than the allocation of money (and, in the case of the SIC programme, supply of business counselling) are needed. With regard to credibility spill over, it seems that this is coupled to the selection, i.e. a rigorous selection creates credibility spill over. This needs further investigation however. It does not seem that the SIC support enabled networking. However, both from the analysis of the SIC programme and the Vinn Nu programme there is evidence that public support acts as an extrinsic motivation factor.

With regard to the second part of this research question, it is shown that clearly stated goals and targets are needed to enable evaluation, and that a lack of these makes evaluation difficult. Furthermore, programmes benefit from being consistent. This consistency should begin with the goals and targets, through the support model and continue through the outcome, i.e. the presence of a programme theory that imbues the programme.

When different programmes are compared, attention must be paid to their goals and the support model, otherwise there is an immediate risk that apples and oranges are measured instead of different varieties of apples, i.e. programmes where the goals and support models diverges substantially cannot be compared under the same conditions. By use of the conceptual model (Figure 1) of public support programmes, evaluation and comparison of programmes can be undertaken in a systematic and structured way. To proceed in this way enables the detection of crucial differences between programmes.

To estimate impact such as additionality of a programme, measurement against a counter-factual (control group) is needed. However, selecting control groups requires thought as attention has to be paid to different types of bias.

Finally, through the studies of Vinn Nu, a new way of evaluating outcome has been tested and developed. Through this method, we expect to gain increased knowledge about the development process of innovative TBVs.

5.5 How does the support provided to TBVs within public programmes correspond to the support that is needed and demanded by the TBVs?

Earlier studies indicate that the support given does not always equal the support demanded (Gibb, 1987; Lindholm-Dahlstrand & Klofsten, 2002). Several factors can generate mismatch, and this can occur also in cases where the support actually corresponds to the needs and demands of its target groups, e.g. due to reasons such as attitudes, priorities and time (cf. Gibb, 1987). Mismatch was also found in the studies of the SIC programme (paper 6), and in this case, the mismatch is constituted by the lack of market focus of the programme. The practice of the SIC programme was to focus on products, product development and product protection, and the vast majority of the money lent out was thereby dedicated to such activities. The implication of this is that several of the ventures supported report that they have experienced severe problems in bridging the gap between product and market. There was awareness of the importance of the market among those that governed the programme, but it seems that the market issue was overshadowed by the issues concerning product development. To realise the importance of the market is trivial but still important. Reaching the market may be even more difficult than product development in itself. This holds especially if the individuals involved are skilled in - and focused on - product development, and, as is addressed in chapter 2, lack skills and knowledge in marketing (cf. Westhead & Storey, 1997).

In the case of the Vinn Nu programme, there is demand for advice and networking activities to complement the finance, i.e. a demand for competent capital. This is also emphasised as something which is important in chapter 2 (cf. Cressy & Olofsson, 1997). One way of providing such competent capital may be cooperation between different support providers. Such cooperation can be found within the Vinn Nu programme, where a large part of the supported firms are coupled to business incubators, from where they get business development assistance. The SIC programme had also cooperation, e.g. between SIC and the Swedish science park organisation, Swedepark, which worked under the denomination "the judgement group of Swedepark". This judgement group worked together with the parks and had administrating officials of its own. The applications from science park firms were thus administrated in co-operation with the staff of the park of the applicant.

Furthermore, there is a demand for more long-term commitment from public financiers, from both SIC and Vinn Nu respondents. This issue of long-term commitment is not new, nor is it a unique finding from this research. It has been mentioned as important in other research (cf. Oakey 2003). It is well known that innovation takes time (Drucker, 1985). This is because accessing new markets with new products often takes time, and thereby is recognized as being a greater risk (Lindström and Olofsson 2001, Oakey 2003).

5.5.1 Summary of RQ 3b

How does the support provided to TBVs within public programmes correspond to the support that is needed and demanded by the TBVs?

To summarise, demand exceeds supply, even in the case of public support, and it is likely that no support programme satisfies all its clients. However, some important remarks have to be made. First, the findings of the SIC programme show that product focused measures are not enough to reach the market. Second, the findings from the Vinn Nu programme emphasise the importance of competent capital, i.e. that solely allocating money is not enough. Third, the findings also show that process-oriented support could be given by the programme in cooperation with other support actors. From this, it can be concluded that helping supported ventures to link to their innovation systems requires a mixture of configuration-oriented and process-oriented support.

5.6 What are the main implications for research and practice with regard to the design of public programmes to support TBVs?

Summarizing the findings in this covering paper along with the findings of the appended papers, the practical implications regarding public support to TBVs could be summarised into the following main bullet points:

- To help the ventures link to the IS, the support must enable the ventures entire early development process, not just parts or aspects there of.
- The support needs to be conformed to the groups that are targeted by the intervention. In addition, both a consistent programme theory and evaluative awareness are needed.
- Long-term commitment, information about present initiatives and cooperation among support actors is needed.

5.6.1 Facilitating IS linkage requires attention to the whole process of development

Above, I have suggested that the main task of public support programmes is to help the ventures supported to link to their IS. To succeed in this, combinations of process-oriented and configuration-oriented support are needed. Furthermore, I argue, along with Storey (2003), that public support should both be regarded and act as a complement to the market.

The commercialisation of an idea implies more than product development. Paper 6 shows a mismatch with regard to support to reach the market. As a result of this, I will argue that product and market not should be treated as separate from each other, but that there has to be an equal focus on the development of both aspects. It must not be forgotten that money from customers is the superior sustainable source of venture finance. Hence, focus

must be put upon this source. Financial sources, such as public support programmes and venture capital finance are, of course, sometimes a prerequisite to develop products or services sufficiently for a market launch, but these sources must be regarded as bridge to the goal of reaching payment from the customers.

To obtain external finance from the market, TBVs need to reach investment readiness. This includes product development as well as the development of the business awareness and skills of the entrepreneurs to communicate their (business) ideas. According to the findings of this research, there is room for improvement in this area. Irrespective of the fact that the creation of investment readiness seems to be easier said than done, it has to be put on the agenda and dealt with. Process-oriented support, given along with the finance (i.e. what is labelled as competent capital), ought to give better prerequisites for an effective utilisation of financial support. Such combinations are therefore worth aiming for. This does not necessarily have to be solved by one support actor; instead, I believe that it is a matter for cooperation between several different support actors.

Because innovation takes time, and because the road to the market is not straight forward, but instead filled with obstacles and struggle, a large portion of motivation is needed to reach the target. Although that motivation is generally strong at the very beginning (Klofsten, 1992) it needs nourishment. This research shows that small sums of money, in the earliest stages of development, are important to motivate the entrepreneur to continue. This is as such finance is regarded as confirmation to continue. Ordering support programmes in steps, as suggested above, might also be a way to give idea owners the acknowledgement that they are on the right track.

Finally, the advice of North et al. (2001) to avoid make things complicated is worth emphasising, as it is also supported by the findings of this thesis. Swift, uncomplicated rules and administration are appreciated. It is also shown that money in itself, irrespective of the size of the sum, is regarded as crucial to development in the earliest stages. Swift administration was one of the strengths of the SIC programme, while another advantage was that the support was not given only to limited firms. Supporting liabilities other than limited companies can at the same time, imply problems, as tax effects may occur. This, therefore, has to be investigated and dealt with if support is to be given to trade firms and sole proprietors.

5.6.2 Conformation, programme theory and evaluative awareness

Trying to capture a too broad scope, instead on focusing on specific target groups and their needs may jeopardize the programme logic, and thereby the outcome as well. I therefore agree with Storey & Tether (1998b) and Lundström & Stevenson (2005) that public support needs to be conformed to fit the ventures that are focused. Although some parts of venture creation are generic, it can be presumed that the needs for support differ between different groups. For example, an independent inventor that starts a firm in order generate self employment, or to commercialise a patent for a uncomplicated

product has quite different needs to a corporate spinoff venture, or a research based start-up venture with a complex product that requires years of research. Hence, instead of trying to create “one-stop-shops”, it seems that diversification and specialisation is a better way to go.

As far as I can see from this study, there is no advantage in applying a too rigorous selection strategy in the very earliest stages of firm development. Instead, it seems better to follow the argumentation of Hoogerwerf (1990) and strive to keep a consistent programme theory. This implies that support providers ought to act in line with the goals of their programmes. Hence (and as shown in paper 5), if a programme aims broadly at supporting early stages idea development, a picking winner’s effort is contrary to its aim.

Furthermore, it is shown that it is difficult to evaluate new, and especially innovative, technologies at an early stage, because of the limited information that is available. Therefore, I suggest that support to ventures in the earliest stages of development should be given in the form of a combination of advice and smaller subsidies or loans to a broader target group. Then, when the ventures have developed further, more rigorous selections can be undertaken, both by private and by public actors. If public support works in this way, it increases its likelihood of acting as complement to the market.

With regard to evaluation, I argue, along with Jaffe (2002) and Storey (2000) that it is highly important that policy makers ensure that their programs have developed evaluative awareness. This implies that evaluation has to be part of the programmes, from the very start. This enables learning and also allows evaluation strategic programme specific data to be collected. Storey (2000; 2003) complains over the fact that most follow-up studies are shallow and represent monitoring/take up of programmes rather than evaluation. From the work with this thesis, I can agree – in part. I also agree with Lengrand (2006) that a combination of several methods might be needed to get a full picture, as different approaches reveal different pieces of the answer(s).

5.6.3 Long-term commitment, information and cooperation

Long-term commitment among public financiers is demanded (papers 6 and 7) and one way of obtaining this is to design support programmes so that they can follow from and complement each other, like links in a chain. This is in line with the conclusion of a study of British support programmes, where greater holism among support initiatives was demanded (North et al., 2001). A first step could be broad aiming support (small sum subsidies and advice) in order to help qualify new venture ideas. After this different types of specialised programmes could follow in order to help promising ideas develop further. As far as I can see, most of the programmes and initiatives present today are, or could rather easily be, ordered this way.

According to the attitude surveys undertaken in this research (papers 6 and 7), lack of information about the support that could be given (and from what sources) seems to be a major problem. This problem is also recognised by

studies such as the one by North et al. (2001). It is my belief that this information gap could be bridged if the support providers that are active coordinated and marketed their actions more clearly. Some efforts in this direction have already been made and one example that could be mentioned is the network model GrowLink, in the province of Östergötland. One of the targets of this network is that two phone calls should be enough, i.e. irrespective of what actor within the network an entrepreneur calls, he or she should get an answer immediately, or be redirected to the actor that deals with his or her question.⁵⁰

Another issue that requires consideration is that TBVs are targeted by at least three policy areas. Although that entrepreneurship policy might be the label that fits the best this calls for attention, as there might be a risk that policy makers work towards parallel actions. The area of entrepreneurship policy is described as horizontal, hence this has to influence its actions. Although innovation policy aims at technology development rather than firm development, these areas overlap, especially when it concerns innovative TBVs. If entrepreneurship- and innovation enabling programmes cannot be united, there must at least be an attempt to link them to each other.

⁵⁰ Sten Gunnar Johansson, CEO Mjärdevi Science park

6 Conclusions and implications

In the introductory chapter of this thesis, a number of research gaps were noted. To start, it was argued that the area of entrepreneurship policy, despite the studies that in fact have been undertaken, is still a rather unexplored area. This research gap concerns both the policy area as such, as well as particular support measures that come under this policy area, e.g. financial support to early stage technology-based ventures. Moreover, public intervention into private venturing is not unproblematic. In fact, some voices have been heard to argue that the allocation of public funding is inefficient, if considered from a socioeconomic perspective, whereas other studies argue the opposite, hence this calls for more investigation. With regard to evaluation, areas such as the longitudinal effects of public intervention and the development of tools for rigorous evaluations are regarded as unexplored. Hence, more knowledge on these areas is needed in order to be able to learn from experience and to make improvements. Additionally, regarding evaluation of policy interventions, it is shown that others than researchers have dominated the area, hence the primary focus has not been on theoretical contributions and on the development on the area of policy theory. This might be the reason why researchers, such as David Storey, have called for increased academic involvement in this area.

By analysing the rationales, goals, design and outcomes of public programmes which aim to support TBVs, and by identifying implications for research and for the practical design of future support efforts within this area, this thesis is my attempt to add to both the academic and the practical knowledge-base on public policy to facilitate entrepreneurship and innovation.

6.1 Main theoretical contributions

The main theoretical contributions of this thesis to the academic knowledge base of policy theory can be summarised as follows:

- A broadening of the theoretical perspectives of public venture support
- Development of a conceptual model for description and assessment of public support programmes

With regard to the former of these two points, this thesis has contributed to the academic knowledge base by applying a broader perspective of public venture support within the policy area of entrepreneurship. In this thesis, the early stage venture development process is explained through theories of resource dependency in combination with an innovation system approach of how to regard the world that surrounds the targeted ventures.

During the venture's earliest stages, the idea develops from a pre-commercialisation stage to a commercialisation stage. To achieve sustainable development and growth ventures need both to secure their inflow of

resources and to be able to utilise these resources efficiently⁵¹. Some resources are internal to the venture, and others are external. In this thesis, the innovation system is regarded as being the external resource base of the new venture. What this entails is that the venture increases in maturity as it increases its connections to the surrounding innovation system. Hence, from a theoretical perspective, the main task of public venture support is to enable the linking process of supported ventures to the innovation system in which the ventures can reach the external resources needed for sustainable development and growth.

Applying this perspective implies that maturity becomes a central aspect of the venture development process. The level of maturity of the venture is central because ventures are vulnerable during their earliest stages of development. When they mature, however, their vulnerability decreases and their freedom of action increases, and hence their efforts and resources can be put into development and growth instead of survival. The aspect of maturity also affects the scope of the policies to support entrepreneurship, i.e. the scope of the entrepreneurship policy area has to be limited and based on maturity, rather than on time, as has been the case so far. Based on this opinion, I argue that the scope of entrepreneurship policy starts by raising awareness of entrepreneurship as an opportunity and ends when the targeted ventures have reached a sustainable stage, i.e. a business platform. Additionally, the TBVs studied in this thesis are focused not only by the area of entrepreneurship policy, but also by SME and innovation policies. Figure 2 on page 24, explains the connection between these three policy areas.

The second main contribution of this thesis is the generation of a conceptual model to describe public support programmes in a generic context (see Figure 1, p. 4 and p. 73). This model is useful as tool for systematic analysis and comparison of different public support programmes. Additionally, and as a complement to this model, a matrix (see Figure 5, p. 74) that facilitates the work to distinguish between different support programme selection strategies has been developed. The matrix and its use will be described below.

6.2 Implications for research and policy

Besides the theoretical contributions presented above, this study has resulted in a range of implications, which can be used both for research and for policy practice. These implications has been divided into three main types; implications coupled to rationales and goals of policy programmes, implications coupled to the support provided and implications coupled to the outcome of public support programmes and to their evaluation.

⁵¹ i.e. they need to attain a business platform (Klofsten 1992).

6.2.1 Implications coupled to rationales and goals

Firstly, this thesis demonstrates clearly that those that have received the support regard public support to early stages ventures as important. This is because the support is (or was) supplied at a stage in the venture development process, where a venture generally faces difficulties obtaining other types of external finance. Actors that are ruled under the conditions of the market (i.e. their investments, must generate return in the short run) cannot invest money in ideas that are in a pre-commercialisation stage, i.e. ideas that are new, undeveloped, unproven and thereby considered to be of high risk. Public actors on the other hand, can rationalise such investments using political arguments, such as prospective societal benefits. Furthermore, public actors can afford to make societal investments over a longer period than those that act under the conditions of the market.

Public support can hence make important contributions, for example in situations where new products are to be launched on the market, as launching new products implies that resources need to be invested before any returns from prospective customers can be generated. In cases where the ventures work with radically new and innovative products or services, the time to market may be long. If the founders cannot cover the costs of development with their own assets, public support can be one way for these ventures to survive until incomes can be generated from the market. Public support then acts as a bridge, or tool, to reach sustainable incomes, such as customer payment. I argue that this complementary role, as a bridge to sustainable incomes, is the key role of public support. If public support is supplied as a complement to the market, problems such as competition under unfair conditions are minimised (i.e. publicly funded support initiatives may crowd-out private initiatives). Additionally, public support has to be based on strong rationales. In this thesis, two main types of rationales have been identified; (1) those based on societal desires, and (2) those based on barriers due to venture characteristics. An example of the former is the political desire to create societal growth, jobs and welfare. To reach this goal, the emergence of innovative ventures is regarded as a key component. The second type of barriers emerge due to firm characteristics, and in the literature, these barriers are generally referred to as the main cause of different aspects of market/firm failure.

Finally, I argue that public support must be based on clearly stated goals and supplied through a consistent programme theory. If not, there is a risk that the programme theory, that imbues the programme, becomes inconsistent. Inconsistency between the goals, support model and expected outcome (i.e. inconsistent programme theory) is one reason why public support programmes fail or underperform. Furthermore, the lack of clearly stated goals complicates evaluation.

6.2.2 Implications coupled to the support provided

The implications connected to the support provided are of two types, those that are general and those coupled to the business support model components, i.e. to the business support measures and to the selection process. I will start with the general implications.

Because TBVs are heterogeneous, one size of support does not fit all types of ventures and all stages of maturity. Therefore, public support has to be customised to fit the ventures targeted, as their needs may differ due to factors such as context, prerequisites and the visions of the different types of ventures. For the very earliest stages of business development, public support should aim broadly in order to give the supported ventures a chance to evaluate the competitive capacity of the idea. Examples of such measures could be market analysis, analysis of how the idea meets with customer needs, and analysis of the freedom to operate, i.e. if there are barriers such as competing IPR protection. From such an analysis, the idea can undergo further development and qualification. Training programmes, which aim at idea qualification, might also be useful in these stages. Support that aims to qualify early stage ideas can be carried out without large costs, as it is shown that small sums are of significance in early stages.

With regard to selection, this thesis shows that public support programmes that aim at the very earliest stages of venture development, and that provide only small sums of money, benefit from applying a selection that is rather shallow (i.e. a survival-of-the-fittest approach), as a swift process ought to be of higher priority. Furthermore, immature and abstract ideas are difficult to evaluate. Hence, efforts to pick winners at these stages should be abandoned. When the ideas become more specified and developed, the selection strategy for follow-on interventions can benefit from more thorough selection, i.e. the selection can shift towards more of a picking-the-winners approach.

The market aspect must not be neglected, but instead has to be emphasised from the very start. Lack of market focus was a shortcoming within the SIC programme. Thus, when public support is given to facilitate idea commercialisation, it is important that equal attention is paid to the areas of product development and market/customer development. If this is neglected, there is a high risk that the venture will fail, as products that lack a market and customers will not generate income, and hence the venture will never enter the commercialisation stage or reach a stage of sustainability.

With regard to the business support model components, it is shown that these vary between different types of programmes, depending on their goals and programme theories. This thesis distinguishes between two types of support; process-oriented support, which includes measures as training, advice, coaching and network mediation, and configuration-oriented which includes support with finance and infrastructure. Most support programmes include both types, and it is emphasised that financial support, should be given in combination with process-oriented support. The reason for this is that such a combination (i.e. competent capital) gives a more efficient use of the

finance. Competent capital in its most refined form can be found among private actors, such as business angels and venture capitalists that supply money against equity shares and take an active part in the management of the firm.

Irrespective of what type of support is supplied, the decision to support or reject applicants is preceded by some kind of selection process. As mentioned above, a four-field matrix of selection strategies (Figure 5), that enables different strategies for selection to be distinguished has been developed. The first dimension of this matrix comprises selection focused upon the idea/technology or the entrepreneur/team respectively. The second dimension distinguish between selection that aims at picking winners and selection that aims more broadly, i.e. at picking prospects, and consciously leave the decision as to whether the venture will survive or not to the market. The four selection strategies are labelled (1) “idea-focused-survival of the fittest”, (2) “entrepreneur-focused-survival of the fittest”, (3) “idea-focused-picking the winners” and (4) “entrepreneur-focused-picking the winners”. These strategies give substantially different venture portfolios. Different support programmes use different selection strategies and ideally, the choice of strategy is coupled to the goal and the theory behind the programme. Following this matrix, the SIC programme can be described as being one which selected from a survival-of-the-fittest and idea focused strategy. The Vinn Nu programme uses a picking-the-winners strategy, which is also the most common strategy among the Swedish incubators.

Selection strategies form one part of the selection. Another, concerns what issues affect the choice of ventures selected for support or rejection. The venture’s ability to communicate its idea is a matter that has a great influence on selection. This is connected both to the characteristics of the idea in itself, and to the entrepreneur(s)’ ability to describe the (business) idea of the venture. The credibility of the venture is another factor that affects selection. For early stage ventures, credibility is often coupled to the entrepreneur(s). Credibility can also be connected to the legal form of the firm, to certain types of industry and the degree of sophistication/knowledge intensity in the specific field.

6.2.3 Implications coupled to outcome and evaluation

When outcome is discussed, it is important to ask what outcome can in fact be expected from public support programmes. This research suggests that public support programmes could be expected to contribute to the business development of the venture supported (i.e. help create investment readiness), spill over credibility to the supported ventures, facilitate networking and increase motivation. When outcome was investigated, it was found that the support programmes studied have played an important role in motivating the supported ventures. There are also indications which show that the fact that ventures have been chosen to receive support may transfer credibility. However, this seems to be coupled to the selection process, i.e. that a careful selection seems to increase the spill over of credibility. This means that the

expectations of credibility spill over from support to ventures in the very earliest stages should not be too high. With regard to the creation of investment readiness, positive indications were found, especially with regard to the development of products, but it seems that there is room for further improvement, especially with regard to aspects of the market. Furthermore, as far as can be seen from this investigation, networking (e.g. network mediation) is also an area where there is plenty of room for improvement.

The need for long-term commitment among public support actors has been emphasised within the qualitative parts of this research. This is in line with the theories of how innovation works – i.e. that innovation takes time and requires endurance. One single programme might not be able to provide long-term commitment, as I have emphasised above, that one size of support does not fit all and that different measures are needed in different stages and contexts. However, if policymakers look at venture support from a holistic perspective, different programmes could be organised to follow on from each other in a systematic way, i.e. in such a way that that one programme could work as a continuation of another. This is especially important in cases where TBVs are supported, as this group is targeted by more than one policy area. This implies that, if a holistic perspective is not applied to policies designed to enable innovation and entrepreneurship in early stages ventures, there is an immediate risk that some types of ventures get attention from more than one policy area, while other types are completely neglected by all. To remedy this risk, I argue that collaboration, or at least mutual awareness, between the agencies and actors representing the related policy areas, is needed. If policy programmes are ordered systematically, a stepwise process can be generated. This could create long-term commitment. A further prerequisite for this to work is that the system of support programmes is made known and marketed to its target groups. This seems to be an area where more could be done. Finally, cooperation among public actors as well as cooperation among public and private actors ought to enable public support to act as a bridge to the market.

With regard to the actual performance evaluation in itself, the following comments can be made: Firstly, based on the experience gained from this research and the findings of other studies, I argue that public support programmes have to develop evaluative awareness and secure a consistent programme theory. There are several reasons for this. One is that without a consistent programme theory, evaluations are difficult to make. It is also shown that lack of programme theory is a common reason why policy programmes fail. Furthermore, evaluation is about being able to make improvements and refinements during the programme period. Besides this, there is the question of learning, as the resources invested can be utilised both by those receiving the support, and by the policymakers that decide how to allocate money and/or design new support activities. Reinventing things that already work is waste of both money and time, as is making the same mistakes over again. Secondly, to be able to evaluate the performance of a support programme, the actual outcome has to be coupled to the goals of the programme and furthermore, these goals must be broken down into

measurable targets. Thirdly, although goal attainment is one way of estimating performance, it does not tell whether the outcome was generated by the programme or by other factors. To investigate the effects of a programme, its outcome has to be related to a counterfactual, i.e. a control group. Fourthly, a major lesson from this work is that different approaches have different merits and add different pieces to the total picture. Hence, a combination of evaluation methods seems to be preferable.

6.3 Further research

As a continuation of the work presented in this thesis, I would like to investigate further the areas listed in the bullet points below:

- Further tests and validation of the framework for incubator best practice assessment, developed in paper 1, and of the generic conceptual model (Figure 1) developed in the covering paper of this thesis.
- Further investigation into, how, and under what circumstances, the effects of credibility spill over can be created from public support.
- Deeper analysis and evaluation of the additionality created by public support initiatives.
- Development of a reliable method to measure maturity.

With regard to the first of the above bullet points, i.e. the incubator assessment framework in paper 1, and the model of public support programmes suggested in this covering paper, further investigations are needed. The incubator framework has only been tested shallowly in paper 1, and the expanded version in the covering paper has only been applied on two programmes. It would therefore be interesting to test these models in a larger context, e.g. in a larger quantitative study. It would also be interesting to make a more comprehensive study of best practice and add questions such as if some support models work better than others, and what model combinations are the most efficient for different contexts and target groups. Such investigations could contribute to deeper knowledge and understanding of how to support the early stage venture development process.

The second bullet point addresses the matter of further investigations into credibility spill over. It is suggested in this thesis that there is a positive relation between thorough selection and credibility spill over from public support programmes. As credibility is shown to be an important factor affecting the ability to link to external actors within the innovation system, the creation of credibility spill over could be a way to facilitate the linking process of new ventures. This issue could be investigated through adding an analysis of one or more support programmes, where the selection process is more rigorous than in the cases investigated for this thesis. Furthermore, expanding the issue and adding theory from the area of venture capital for example, would most probably generate interesting insights.

The issue of what additionality is created by public interventions calls for further analysis. Firstly, as this thesis has added a broader perspective of public support, there is room for more analysis of what outcomes could be expected from different support actions. The findings from paper 5 show that there is small evidence of any impact of the seed finance given by SIC. It would be interesting to know if these results are unique for the SIC programme or if similar findings could be obtained by analysis of other support programmes. This could be investigated by applying the method of match case analysis used in paper 5, to support programmes such as Vinn Nu and Almi. It would also be interesting to conduct international comparisons.

Additionally, there are other aspects of the issue of the additionality created by public support programmes. The findings of paper 5 are drawn from a quantitative analysis of the accounting data of a substantial number of firms, but still, this method represents only one way of measuring. In the previous chapter, I argue that multiple methods are of advantage, to deepen the understanding. The analysis of paper 5 shows that there are outliers, both among supported and rejected ventures in the sample analysed. Hence, to be able to understand and explain the implications of this result, more analysis, preferably of a qualitative character, is needed. To do this, I suggest a research approach where 2-3 matched pairs of ventures, whereof one is supported, and one has developed without public support, are investigated through case studies. From such an analysis, the effects and significance of policy interventions could be illustrated and understood. Additionally, such analysis could supply indications of the presence of other actors that, in the case of the un-supported ventures, have replaced the role of the policy programme.

This thesis shows that needs and demands from developing ventures are not fully met by the support provided. Based on this, it would be interesting to add questions such as what support measures are the most important in different stages. We know that competent capital is an advantage, but are certain mixes better than others? Are certain proportions of support more advantageous than others? Does this differ with regards to different types of firms and stages?

The last of the bullet points above concerns the development of a reliable method to measure maturity. This is of importance since it is argued in this thesis that the scope of entrepreneurship policy should be limited by the degree of maturity of the venture instead of by time. Hence, to find a method that easily and reliably could measure maturity is a challenge.

With regards to methods, a recent Swedish report (Regeringskansliet, 2006), has demanded development of new methods of evaluation. Within the ongoing work of the evaluation of the Vinn Nu programme, a new method for evaluation has been tested. Although that this method has been continuously improved during this work, it can be developed further. One example is that it would be useful, both for the TBV entrepreneurs and for their supporters, if the method could also be used to estimate the current level of firm

development. Such knowledge would be useful on both the operational level (e.g. business advisors and coaches in their counselling and training activities) and political level (e.g. policy makers and programme owners, as certain groups might have certain needs in common). Furthermore, if the suggested maturity-based limitation of the scope of entrepreneurship policy is to gain acceptance, also within quantitative studies, containing larger samples of data, ratios that indicate the level of maturity are needed. The fact that this seem to be Utopia must be regarded as a challenge rather than as an excuse from refraining from making attempts.

7 References

- (862/94). Regeringsbeslut 23: Upprättande av Stiftelsen Innovationscentrum, 1994 (Governmental decision).
- (Prop. 1993/94:206). Regeringens Proposition: Innovationsstöd (Governmental proposition: Innovation support).
- Akerlof, G. A. (1970). The Market for 'Lemons': Quality Uncertainty and the Market Mechanism. *Quarterly Journal of Economics*, 84(3), 488-500.
- Allen, D. N., & McCluskey, R. (1990). Structure, policy, services, and performance in the business incubator industry., *Entrepreneurship: Theory & Practice* (Vol. 15, pp. 61): Blackwell Publishing Limited.
- Almus, M., & Nerlinger, E. A. (1999). Growth of New Technology-Based Firms: Which Factors Matter? *Small Business Economics*, 13, 141-154.
- Alvesson, M., & Sköldbäck, K. (1994). *Tolkning och reflektion*. Lund: Studentlitteratur.
- Anderson, J. E. (2003). *Public policymaking* (5 ed.). Boston, New York: Houghton Mifflin Company.
- Arbnor, I., & Bjerke, B. (1994). *Företagsekonomisk metodlära* (Second edition ed.). Lund: Studentlitteratur.
- Asheim, B. T., & Gertler, M. S. (2004). The Geography of Innovation: Regional Innovation Systems. In J. Fagerberg, D. Mowery & R. Nelson (Eds.), *The Oxford Handbook of Innovation* (pp. 291-317). Oxford.
- Audretsch, D. B. (2002). *Entrepreneurship: A Survey of the Literature*: European Commission, Enterprise Directorate General.
- Audretsch, D. B. (2004). Sustaining Innovation and Growth: Public Policy Support for Entrepreneurship. *Industry and Innovation*, 11(3), 167-191.
- Audretsch, D. B., & Beckmann, A. M. (2007). From small business to entrepreneurship policy. In D. B. Audretsch, I. Girilo & A. R. Thurik (Eds.), *Handbook of Research on Entrepreneurship Policy* (pp. 94-129). Cheltenham: Edward Elgar.
- Audretsch, D. B., Grilo, I., & Thurik, A. R. (2007). Explaining entrepreneurship and the role of policy: a framework. In D. B. Audretsch, I. Girilo & A. R. Thurik (Eds.), *Handbook of Research on Entrepreneurship Policy* (pp. 94-129). Cheltenham: Edward Elgar.
- Autio, E., & Klofsten, M. (1998). A Comparative Study of Two European Business Incubators. *Journal of Small Business Management*, 30-43.
- Autio, E., & Yli-Renko, H. (1998). New, technology-based firms in small open economies--An analysis based on the Finnish experience. *Research Policy*, 26(9), 973-987.
- Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17(1), 99.

- Barney, J. B. (2001). Is the Resource-Based 'View' a Useful Perspective for Strategic Management Research? Yes. *Academy of Management Review*, 26(1), 41.
- Bator, F. M. (1958). The Anatomy of Market Failure. *Quarterly Journal of Economics*, 72(3), 351-379.
- Baum, J. A. C., & Silverman, B. S. (2004). Picking winners or building them? Alliance, intellectual, and human capital as selection criteria in venture financing and performance of biotechnology startups. *Journal of Business Venturing*, 19, 411-436.
- Baumol, W. J. (1996). Entrepreneurship: Productive, unproductive, and destructive. *Journal of Business Venturing*, 11(1), 3-22.
- Bearse, P. (1998). A Question of Evaluation: NBIA's Impact Assessment of Business Incubators. *Economic Development Quarterly*, 12(4), 322-333.
- Bergek, A., Jacobsson, S., Hekkert, M., & Smith, K. (2008). Functionality of innovation systems as a rationale for, and guide to innovation policy. In R. Smits, Kuhlmann, S. and Shapira, P. (eds) (Ed.), *Innovation policy, theory and practice: An international handbook*, Forthcoming: Elgar Publishers.
- Berggren, B., Olofsson, C., & Silver, L. (2000). Control aversion and the search for external financing in Swedish SMEs. *Small Business Economics*, 15, 233-242.
- Bergström, F. (2000). Capital Subsidies and the Performance of Firms. *Small Business Economics*, 14, 183-193.
- Bhabra-Remedios, R. K., & Cornelius, B. (2003, 28 September-1 October). *Cracks in the Egg: improving performance measures in business incubator research*. Paper presented at the Small Enterprise Association of Australia and New Zealand 16th annual Conference, Ballarat.
- Birley, S. (1985). The Role of Networks in the Entrepreneurial Process. *Journal of Business Venturing*, 1(1), 107.
- Birley, S., & Norburn, D. (1985). Small vs. Large Companies: The Entrepreneurial Conundrum. *Journal of Business Strategy*, 6(1), 81.
- Bjerke, B. (2005). *Förklara eller förstå entreprenörskap*. Lund: Studentlitteratur.
- Bollingtoft, A., & Ulhoi, J. P. (2004). The networked business incubator--leveraging entrepreneurial agency? *Journal of Business Venturing*, 20(2), 265-290.
- Bryman, A., & Cramer, D. (2005). *Quantitative Data Analysis with SPSS 12 and 13: A guide for social scientists*. London and New York: Routledge.
- Bygrave, W. D., & Timmons, J. A. (1992). *Venture capital at the crossroads*. Boston Massachusetts: Harvard Business School Press.
- Carlsson, B. (2004). *Innovation Systems: A Survey of the Literature from a Schumpeterian Perspective*. Paper presented at the International J.A. Schumpeter Society Conference, Milan, Italy, June 9-12.
- Carpenter, R. E., & Petersen, B. C. (2002). Capital market imperfections, high-tech investment, and new equity financing. *The Economic Journal*, 112, f54-72.
- Choo, S., & Wong, M. (2006). Entrepreneurial Intention: Triggers and Barriers to New Venture Creations in Singapore. *Singapore Management Review*, 28(2), 47-64.

- Chrisman, J. J., & McMullan, E. W. (2000). A Preliminary Assessment of Outsider Assistance as a Knowledge Resource: The Longer-Term Impact of New Venture Counselling. *Entrepreneurship: Theory & Practice*, 24(3), 37.
- Colombo, M. G., & Delmastro, M. (2002). How effective are technology incubators?: Evidence from Italy. *Research Policy*, 31(7), 1103-1122.
- COM. (2005). *Decision of the European Parliament and the Council: Establishing a Competitiveness and Innovation Framework Programme (2007-2013)*. Brussels: Commission of the European Communities.
- COM. (2006). *Communication from the Commission to the Council, the European parliament, the European Economic and social committee and the Committee of the regions Putting knowledge into practice: A broad-based innovation strategy for the EU*. Brussels: Commission of the European Communities.
- Cooper, A. C., & Bruno, A. V. (1977). Success Among High-Technology Firms. *Business Horizons*, 20(2), 16.
- Cressy, R. (2002). Funding gaps: a symposium. *The Economic Journal*, 112, F1-F16.
- Cressy, R., & Olofsson, C. (1997). The financial conditions for Swedish SMEs: Survey and research agenda. *Small Business Economics*, 9, 179-194.
- Davidsson, P. (2003). The Domain of Entrepreneurship Research: Some suggestions. In J. Katz & D. Shepherd (Eds.), *Cognitive Approaches to Entrepreneurship Research (vol 6)* (pp. 315-372): Elsevier Science.
- Davidsson, P., & Klofsten, M. (2003). The Business Platform: Developing an Instrument to Gauge and to Assist the Development of Young Firms. *Journal of Small Business Management*, 41(1), 1-26.
- de Meza, D. (2002). Overlending?, *Economic Journal* (Vol. 112, pp. F17): Blackwell Publishing Limited.
- de Neergaard, C. (2004). *Bättre finansiering för kommersialisering av innovationer*. Stockholm.
- Deakins, D. (1994). Risk Assessment with Asymmetric Information., *International Journal of Bank Marketing* (Vol. 12, pp. 24): Emerald.
- Drucker, P. F. (1985). *Innovation and entrepreneurship*. London: Heineman.
- Ds. (2004:36). *Innovativa Sverige - En strategi för tillväxt genom förnyelse (Innovative Sweden, a strategy for growth through renewal)*. Stockholm: Näringsdepartementet och utbildningsdepartementet.
- Edling, J., Hermansson, K., Nilsson, R., & Nordborg, J. (2007). *Innovativa små och medelstora företag - Sveriges framtid*. Stockholm: VINNOVA.
- Edquist, C. (2004). Systems of Innovation, perspectives and changes. In J. Fagerberg, D. Mowery & R. Nelson (Eds.), *The Oxford Handbook of Innovation* (pp. 181-208). Oxford.
- Edquist, C., & Johnson, B. (1997). Institutions and Organizations in Systems of Innovation. In C. E. Edquist (Ed.), *Systems of Innovation: Technologies, Institutions and Organizations* (pp. pp. 41-63). London: Pinter Publishers.
- EVCA. (2006). *EVCA Yearbook 2006*. Belgium: EVCA.

- Flynn, B. B., Sakakibara, S., Schroeder, R. G., Kimberly, A. B., & Flynn, E. J. (1990). Empirical Research Methods in Operations Management. *Journal of operations management*, 9(2), 250-284.
- Gartner, W. B. (1988). 'Who is an Entrepreneur?' Is the Wrong Question., *American Journal of Small Business* (Vol. 12, pp. 11): Entrepreneurship Theory & Practice.
- Gaur, A. S., & Gaur, S. S. (2006). *Statistical methods for practice and research: A guide to data analysis using SPSS*. New Delhi: Response Books/ Sage Publications.
- Gibb, A. A. (1987). Designing Effective Programmes for Encouraging the Business Start-up Process. *Journal of European Industrial Training*, 11(4), 24-32.
- Gilbert, B. A., Audretsch, D. B., & McDougall, P. P. (2004). The Emergence of Entrepreneurship Policy. *Small Business Economics*, 22, 313-323.
- Greene, F. J., & Storey, D. J. (2007). Issues in evaluation: the case of Shell Livewire. In D. B. Audretsch, I. Girilo & A. R. Thurik (Eds.), *Handbook of Research on Entrepreneurship Policy* (pp. 94-129). Cheltenham: Edward Elgar.
- Gustavsson, B. (2004). *Kunskapande metoder inom samhällsvetenskapen* (3 ed.). Lund: Studentlitteratur.
- Hackett, S. M., & Dilts, D. M. (2004). A Systematic Review of Business Incubation Research. *Journal of Technology Transfer*, 29, 55-82.
- Harding, R. (2000). Venture capital and regional development: towards a venture capital system, *Venture Capital: An International Journal of Entrepreneurial Finance* (Vol. 2., pp. 287-311).
- Harding, R. (2002). Plugging the knowledge gap: an international comparison of the role for policy in the venture capital market, *Venture Capital: An International Journal of Entrepreneurial Finance* (Vol. 4, pp. 59 - 76).
- Harhoff, D., & Stahl, K. (1998). Legal Form, Growth and Exit of West German Firms -- Empirical Results for Manufacturing, Construction, Trade and Service Industries, *Journal of Industrial Economics* (Vol. 46, pp. 453-488): Blackwell Publishing Limited.
- Heydebreck, P., Klofsten, M., & Maier, J. C. (2000). Innovation support for new technology-based firms: the Swedish Teknopol approach. *R&D Management* 30, 1, 89-100.
- Hjalmarsson, D. (1998). *Program Theory for Public Business Advisory Service*. Unpublished Doctoral thesis, Uppsala University, Uppsala.
- Hjalmarsson, D., & Johansson, A. W. (2003). Public advisory services - theory and practice. *Entrepreneurship & Regional Development*, 15(1), 83.
- Holme, I. M., & Solvang, B. K. (1991). *Forskningsmetodik Om kvantitativa och kvalitativa metoder* (B. Nilsson, Trans.). Lund 1995: Studentlitteratur.
- Hoogerwerf, A. (1990). Reconstructing policy theory. *Evaluation and Program Planning*, 13(3), 285-291.
- Hsu, P., Shyu, J. Z., Yu, H., Yuo, C., & Lo, T. (2003). Exploring the interaction between incubators and industrial clusters: the case of the itri incubator in Taiwan., *R & D Management* (Vol. 33, pp. 79-90): Blackwell Publishing Limited.

- Huffman, D., & Quigley, J. M. (2002). The role of the university in attracting high tech entrepreneurship: A Silicon Valley tale., *Annals of Regional Science* (Vol. 36, pp. 403): Springer - Verlag New York, Inc.
- Jaffe, A. B. (2002). Building programme evaluation into the design of public research-support programmes. *Oxford Review of Economic Policy*, 18(1), 22-34.
- Jones-Evans, D. (1997). Technical Entrepreneurship, Experience and the Management of Small Technology-Based Firms. In D. Jones-Evans & M. Klofsten (Eds.), *Technology, Innovation and Enterprise: The European Experience* (pp. 11-60). Wiltshire: MacMillan Press Ltd.
- Klofsten, M. (1992). *Tidiga utvecklingsprocesser i teknikbaserade företag*. Unpublished Doctoral dissertation, Linköping University, Linköping.
- Klofsten, M. (1997). Management of the Early Development Process in Technology-based Firms. In D. Jones-Evans & M. Klofsten (Eds.), *Technology, innovation and enterprise: The European Experience* (1 ed., pp. 148-178). Chippenham, Wiltshire: Macmillan Press LTD.
- Klofsten, M. (2005). New Venture Ideas: An Analysis of their Origin and Early Development. *Technology Analysis & Strategic Management*, 17(1), 105-119.
- Klofsten, M., Jonsson, M., & Simón, J. (1999). Supporting the pre-commercialisation stages of technology-based firms: the effects of small-scale venture capital. *Venture Capital: An International Journal of Entrepreneurial Finance*, 1(1), 83-93.
- Klofsten, M., & Lindholm-Dahlstrand, Å. (2000). Financing Technology-Based New Ventures: Credibility and Value Creation. In W. Daring, R. Oakey & M. Kipling (Eds.), *New technology-based firms at the turn of the century* (Vol. Chapter 10, pp. 127-142): Elsevier Science Ltd.
- Landström, H. (2005a). *Entreprenörskapets rötter* (3 ed.). Lund: Studentlitteratur.
- Landström, H. (2005b). *Pioneers in entrepreneurship and small business research* (Draft edition ed.). New York: Springer.
- Larsson, T. (2006). Uppfinnarfrågan under 120 år (The issue of inventors during 120 years) (pp. 47): Uppfinnarkollegiet.
- Lawton, T. C. (2002). Missing the target: assessing the role of government in bridging the European equity gap and enhancing economic growth, *Venture Capital: An International Journal of Entrepreneurial Finance* (Vol. 4, pp. 7 - 23).
- Lengrand, L. (2006). Final Report – Supporting the Monitoring and Evaluation of Innovation Programmes (pp. 150). ECSC-EC-EAEC Brussels-Luxembourg: DG Enterprise and Industry, European Commission.
- Lerner, J. (2002). When Bureaucrats Meet Entrepreneurs: The Design of Effective Public Venture Capital Programmes., *Economic Journal* (Vol. 112, pp. F73-F84): Blackwell Publishing Limited.
- Lindelöf, P., & Löfsten, H. (2004). *Teori och metoder för val av indikatorer för inkubatorer (Theory and methods for the choice of indicators for incubators)*. Göteborg, Sweden: Institute for Management for Innovation and Technology (IMIT) CTH, Institutionen för Industriell Dynamik.

- Lindholm-Dahlstrand, Å. (2004). *Teknikbaserat nyföretagande - tillväxt och affärsutveckling*. Lund: Studentlitteratur.
- Lindholm-Dahlstrand, Å., & Cetindamar, D. (2000). The dynamics of innovation financing in Sweden, *Venture Capital: An International Journal of Entrepreneurial Finance* (Vol. 2, pp. 203-221).
- Lindholm-Dahlstrand, Å., & Klofsten, M. (2002). *Growth and Innovation Support in Swedish Science Parks and Incubators*. Oxford: Elsevier Science.
- Lindström, G., & Olofsson, C. (2001). Early stage financing of NTBFs: an analysis of contributions from support actors, *Venture Capital* (Vol. 3, pp. 151-168).
- Ljung, J. (1993). *Idébaserad verksamhet En studie av frikyrkan som organisation*. Unpublished Doctoral Dissertation, Linköping University, Linköping.
- Lumpkin, J. R., & Ireland, R. D. (1988). Screening practices of new business incubators: The evaluation or critical success factors. *American Journal of Small Business*, 12(4), 59-81.
- Lundström, A., Almerud, M., & Stevenson, L. (2008). Entrepreneurship and innovation policies (pp. 216): Innovation Policy Research for Economic Growth (IPREG) Working Group on Future Research.
- Lundström, A., & Stevenson, L. (2002). *On the Road to Entrepreneurship Policy* (Vol. 1). Stockholm: FSF.
- Lundström, A., & Stevenson, L. (2005). *Entrepreneurship policy: Theory and Practice*: Springer, USA.
- Lyons, T. S., & Li, S. (2003). *The State of the Wisconsin Incubation Industry in 2002: An Analysis of the Results of the Survey of Membership* (Report prepared for The Wisconsin Business Incubation Association).
- Löfsten, H., & Lindelöf, P. (2003). Determinants for an entrepreneurial milieu: Science Parks and business policy in growing firms. *Technovation*, 23, 51-64.
- Macmillan, H. P. (1931). *Committee on Finance and Industry Report*. London: His Majesty's Stationery Office.
- Maigart, S., & Struyf, C. (1997). Financing high technology startups in Belgium: An explorative study. *Small Business Economics*, 9, 125-135.
- Malerba, F. (2005). Sectoral systems of innovation: a framework for linking innovation to the knowledge base, structure and dynamics of sectors. *Economics of Innovation & New Technology*, 14(1/2), 63-82.
- Martin, S., & Scott, J. T. (2000). The nature of innovation market failure and the design of public support for private innovation, *Research Policy* (pp. 437-447).
- Mason, C. M., & Harrison, R. T. (1997). Business Angel Networks and the Development of the Informal Venture Capital Market in the U.K.: Is There Still a Role for the Public Sector? *Small Business Economics*, 9, 111-123.
- Mason, C. M., & Harrison, R. T. (2001). 'Investment Readiness': A Critique of Government Proposals to Increase the Demand for Venture Capital., *Regional Studies* (Vol. 35, pp. 663-668): Carfax Publishing Company.

- Mason, C. M., & Harrison, R. T. (2002). Barriers to investment in the informal venture capital sector., *Entrepreneurship & Regional Development* (Vol. 14, pp. 271-287): Taylor & Francis Ltd.
- Mason, C. M., & Harrison, R. T. (2003). Closing the Regional Equity Gap? A Critique of the Department of Trade and Industry's Regional Venture Capital Funds Initiative., *Regional Studies* (Vol. 37, pp. 855): Carfax Publishing Company.
- Mason, C. M., & Harrison, R. T. (2004). Improving access to early stage venture capital in regional economies: A new approach to investment Readiness, *Local Economy* (Vol. 19, pp. 159-173).
- Mason, C. M., & Stark, M. (2004). What do Investors Look for in a Business Plan? A Comparison of the Investment Criteria of Bankers, Venture Capitalists and Business Angels. *International Small Business Journal*, 22(3), 227-248.
- McGlue, D. (2002). The funding of venture capital in Europe: issues for public policy, *Venture Capital: An International Journal of Entrepreneurial Finance* (Vol. 4, pp. 45-58).
- Meyer, M. (2005). Independent inventors and public support measures: insights from 33 case studies in Finland. *World Patent Information*, 27, 113-123.
- Mian, S. A. (1997). Assessing and managing the university technology business incubator: An integrative framework. *Journal of Business Venturing*, 12(4), 251-285.
- Mosselman, M., Prince, Y., & Kemp, R. (2004). Review of the methodologies to measure effectiveness of state aid to SMEs, *Final Report to the European Commission*. (pp. 1-114).
- Naffziger, D. W., Hornsby, J. S., & Kuratko, D. F. (1994). A Proposed Research Model of Entrepreneurial Motivation. *Entrepreneurship: Theory & Practice*, 18(3), 29-42.
- Norrman, C. (2004). *Genus och innovationsstöd - En studie av SICs villkorslån mellan åren 1994 och 2003* (Report No. 1:2004). Linköping: Linköping University, Department of Management and Economics.
- Norrman, C. (2005). *Publicly Financed Support of Technology-Based Ventures*. Linköping University, Linköping.
- Norrman, C. (2006). Innovationsbidrag och Villkorslån - En studie av SICs innovationsbidrag och villkorslån mellan åren 1994 och 2003 (Innovation subsidies and conditional loans - A study of SIC's innovation subsidies and conditional loans during the years of 1994-2003) (pp. 90). Linköping: IMIE Working paper series No. 3:2006.
- Norrman, C., & Klofsten, M. (2006). *Uppföljning av 2002- och 2003 års VINN NU-företag*. Linköping: Linköping University.
- North, D., Smallbone, D., & Vickers, I. (2001). Public Sector Support for Innovating SMEs. *Small Business Economics*, 16, 303-317.
- Nouira, S. (2005). *Early-stage finance - Exploring the financial context of small and young knowledge-intensive firms*. Unpublished LiU-Tek-Lic 2005:74; Linköping studies in science and technology Thesis No 1222, Linköping University, Linköping.
- Nouira, S., Klofsten, M., & Lindholm-Dahlstrand, Å. (2005). The logic of the entrepreneur: Implications of the entrepreneur's perception of early-stage financing. *International Journal of Entrepreneurship & Innovation*, 6(2), 85-96.

- Oakey, R. P. (2003). Funding innovation and growth in UK new technology-based firms: some observations on contributions from the public and private sectors, *Venture Capital*, (Vol. 5, pp. 161-179).
- OECD. (2006). *Going for Growth* (Vol. 1).
- Parker, S. C. (2007). Policymakers beware! In D. B. Audretsch, I. Girilo & A. R. Thurik (Eds.), *Handbook of Research on Entrepreneurship Policy* (pp. 94-129). Cheltenham: Edward Elgar.
- Peirce, C. S. (1990). *Pragmatism och kosmologi*, Matz, Richard (eds). Göteborg: Didalos AB.
- Penrose, E. T. (1959). *The theory of the growth of the firm*. London: Basil Blackwell Publisher.
- Peters, L., Rice, M., & Sundararajan, M. (2004). The Role of Incubators in the Entrepreneurial Process. *Journal of Technology Transfer*, 29, 83-91.
- Phan, P. H., Siegel, D. S., & Wright, M. (2004). Science parks and incubators: observations, synthesis and future research. *Journal of Business Venturing*, 20(2), 165-182.
- Phillips, R. G. (2002). Technology business incubators: how effective as technology transfer mechanisms? *Technology in Society*, 24, 299-316.
- Ramachandran, K., & Sougata, R. (2006). Networking and New Venture Resource Strategies: A Study of Information Technology Start-ups. *The Journal of Entrepreneurship*, 15(2), 145-168.
- Regeringskansliet. (2006). En nationell strategi för regional konkurrenskraft, entreprenörskap och sysselsättning 2007-2013 (pp. 63). Stockholm: The Swedish Government, The Ministry of Trade and Industry.
- Rickne, A. (2000). *New Technology-based firms and Industrial Dynamics: Evidence from the Technological System of Biomaterials in Sweden, Ohio and Massachusetts*. Unpublished Diss., Chalmers University of Technology, Göteborg.
- Rickne, A., & Jacobsson, S. (1999). New technology-based firms in Sweden -- A study of their direct impact on industrial renewal, *Economics of Innovation & New Technology* (Vol. 8, pp. 197): Routledge, Ltd.
- Rothschild, L., & Darr, A. (2005). Technological incubators and the social construction of innovation networks: an Israeli case study., *Technovation* (Vol. 25, pp. 59-67).
- Rothschild, M., & Stiglitz, J. (1976). Equilibrium in competitive insurance markets: an essay on the economics of imperfect information. *Quarterly Journal of Economics*, 90, 629-649.
- Rothwell, R. (1984). Creating a Regional Innovation-Oriented Infrastructure: The Role of Public Procurement. *Annals of Public & Co-operative Economy*, 55(2), 159-172.
- Rothwell, R., & Zegveld, W. (1984). An Assessment of Government Innovation Policies. *Policy Studies Review*, 3(3/4), 436-444.
- Rush, H., Bessant, J., & Lees, S. (2004). Assessing the Effectiveness of Technology Policy--A Long-Term View. *Technology Analysis & Strategic Management*, 16(3), 327-342.
- Salmenkaita, J.-P., & Salo, A. (2002). Rationales for Government Intervention in the Commercialization of New Technologies. *Technology Analysis and Strategic Management*, 14(2), 183-200.

- Schumpeter, J. A. (1934). *The Theory of Economic Development*. New Brunswick: Transaction Publishers.
- Shane, S., & Cable, D. (2002). Network Ties, Reputation, and the Financing of New Ventures., *Management Science* (Vol. 48, pp. 364): INFORMS: Institute for Operations Research.
- Shane, S., & Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research, *Academy of Management Review* (Vol. 25, pp. 217-226): Academy of Management.
- SIC. Näring åt Goda idéer - Ansökan om villkorlån (Information Broschure/ Application form). Stockholm: Stiftelsen Innovationscentrum/ Sweden innovation centre.
- SIC. (2002). *Stiftelsen Innovationscentrum 2002 (Sweden Innovation Centre 2002)*. Stockholm: Stiftelsen Innovationscentrum.
- SIC. (2004). *10 år med Stiftelsen Innovationscentrum (10 years with Sweden Innovation Centre)*. Stockholm: Stiftelsen Innovationscentrum.
- Siegel, D. S., Westhead, P., & Wright, M. (2003). Assessing the impact of university science parks on research productivity: exploratory firm-level evidence from the United Kingdom. *International Journal of Industrial Organization*, 21(9), 1357-1369.
- Stevenson, L., & Lundström, A. (2007). Dressing the emperor: the fabric of entrepreneurship policy. In D. B. Audretsch, I. Girilo & A. R. Thurik (Eds.), *Handbook of Research on Entrepreneurship Policy* (pp. 94-129). Cheltenham: Edward Elgar.
- Stinchcombe, A. L. (1965). Social Structure and Organizations. In J. G. March (Ed.), *Handbook of Organizations* (Reprint 1987 ed., Vol. 1, pp. 142-193). New York: Garland Publishing Inc.
- Storey, D. J. (1994). *Understanding the small business sector*. London: Routledge.
- Storey, D. J. (2000). Six steps to heaven: Evaluating the impact of public policies to support small business in developed economies. In Sexton & Landström (Eds.), *The Blackwell handbook of entrepreneurship* (pp. 176-193): Blackwell Publishing.
- Storey, D. J. (2003). Entrepreneurship, Small and Medium Sized Enterprises and Public Policies. In Z. J. Acs & D. B. Audretsch (Eds.), *Handbook of Entrepreneurship Research*. Great Britain: Cluwer Academic Publishers.
- Storey, D. J. (2004). Evaluation of SME policies. 2nd OECD conference of ministers responsible for small and medium-sized enterprises (SMEs), Istanbul , Turkey, 3-5 June 2004: OECD.
- Storey, D. J., & Tether, B. S. (1998a). New technology-based firms in the European union: an introduction. *Research Policy*, 26(9), 933-946.
- Storey, D. J., & Tether, B. S. (1998b). Public policy measures to support new technology-based firms in the European Union. *Research Policy*, 26(9), 1037-1057.
- SVCA. (2000). *Directory 2000-2001*. Stockholm: Swedish Private Equity & Venture Capital Association.
- SVCA. (2002). *Directory 2002-2003*. Stockholm: Swedish Private Equity & Venture Capital Association.

- SVCA. (2003). *Directory 2003-2004*. Stockholm: Swedish Private Equity & Venture Capital Association.
- SVCA. (2005). *Directory 2005-2006*. Stockholm: Swedish Private Equity & Venture Capital Association.
- SVCA. (2007). *Directory 2006-2007*. Stockholm: Swedish Private Equity & Venture Capital Association.
- Svensson, R. (2007). Commercialization of patents and external financing during the R&D phase. *Research Policy*, 36(7), 1052-1069.
- Sverke, M. (2003a). Design, urval och analys i kvantitativa undersökningar. In B. Gustavsson (Ed.), *Kunskapande metoder inom samhällsvetenskapen* (pp. 21-45). Lund: Studentlitteratur.
- Sverke, M. (2003b). Kvantitativa metoder: Om konsten att mäta det man vill mäta. In B. Gustavsson (Ed.), *Kunskapande metoder inom samhällsvetenskapen* (pp. 47-69). Lund: Studentlitteratur.
- Thurén, T. (1992). *Reportagens Rika Reportrar*. Unpublished Dissertation, Stockholms Universitet, Stockholm.
- Tucker, J., & Lean, J. (2003). Small firm finance and public policy, *Journal of Small Business and Enterprise Development* (Vol. 10, pp. 50-61).
- Van de Ven, A., H. (1993). The development of an infrastructure for entrepreneurship. *Journal of Business Venturing*, 8, 211-230.
- Vedin, B. A. (1993). *Innovationer för Sverige: Betänkande av Innovationsutredningen* (Vol. SOU 1993:84). Stockholm: Näringsdepartementet.
- Vedung, E. (1998). *Utvärdering i politik och förvaltning (Evaluation in politics and administration)* (2nd ed.). Lund: Studentlitteratur.
- Wessner, C. W. (2005). Driving Innovations Across the Valley of Death. *Research Technology Management*, 48(1), 9-12.
- Wessner, C. W. (2007). Government programs to encourage innovation by start-ups and SMEs: the role of US innovation awards. In D. B. Audretsch, I. Girilo & A. R. Thurik (Eds.), *Handbook of Research on Entrepreneurship Policy* (pp. 94-129). Cheltenham: Edward Elgar.
- Westhead, P., Batstone, S., & Martin, F. (2000). Technology-Based Firms Located on Science Parks: the Applicability of bullock's "Soft -Hard" Model, *Enterprise & Innovation Management Studies* (Vol. 1, pp. 107-139).
- Westhead, P., & Storey, D. J. (1997). Financial constraints on the growth of high technology small firms in the United Kingdom., *Applied Financial Economics* (Vol. 7, pp. 197-201): Routledge, Ltd.
- Wigblad, R. (2003). *Outline of research strategies for experimental knowledge*. Paper presented at the 17th Nordic Conference of Business Studies, Reykjavik.
- Vinnova, & Energimyndigheten. (2006). Utlysning Vinn Nu, vår och höst (Call Vinn Nu). Stockholm: Vinnova.
- Yin, R. K. (1994). *Case Study Research*. Thousand Oaks, California: Sage Publications.

- Zacharakis, A. L., & Meyer, G. D. (2000). The potential of actuarial decision models: Can they improve the venture capital investment decision? *Journal of Business Venturing*, *15*, 323-346.
- Zimmerman, M. A., & Zeitz, G. J. f. (2002). Beyond survival: Achieving new venture growth by building legitimacy. *Academy of Management Review*, *27*(3), 414-431.
- Åstebro, T. (2003). The return to independent invention: evidence of unrealistic optimism, risk seeking or skewness loving? *The Economic Journal*, *113*, 226-239.